ROADS and STREETS

UNIVERSITY MICROFILMS
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HIGHWAYS • BRIDGES • AIR FIELDS • HEAVY CONSTRUCTION

A GILLETTE PUBLICATION

Gillette Publishing Co., 22 West Maple St., Chicago 10, Illinois • Accepted as Controlled Circulation Publication at Milwaukee, Wis.

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September 1958

AMERICAN COLEMAN EXECUTIVES inspect a G40 aircraft towing tractor powered by Chrysler Ind. 30 engine. Left to right, E. L. Martin, President; D. G. Higgins, Sales Manager; B. I. Noble, Vice President.

why American Coleman powers with CHRYSLER industrial engines

American Coleman Aircraft towing tractor (Model G40 shown) is used all over the world to tow Air Force planes. It is built to tow a gross load of 100,000 lbs. on any terrain—from desert to ice. On dry concrete it can handle ½ million pounds with ease. It also has a highway speed of 40 mph so it can be used to tow equipment, too; the broad rear deck carries crews to and from landing areas. The unit must operate at full torque output on 'round-the-clock schedules.

To meet these exacting power demands, Coleman chose Chrysler Industrial Engines for several reasons:

- Chrysler was first to develop and prove by field tests a high-speed, long-life industrial engine.
- Chrysler supplies engine and torque converter as an integral unit—ready to go.
- Chrysler's network of parts and service assures minimum down time losses.
- Coleman customers were already "sold" on Chrysler power because they had used Chrysler engines in other units.

That is why five models of the American Coleman tractors are powered exclusively by Chrysler Industrial Engines.

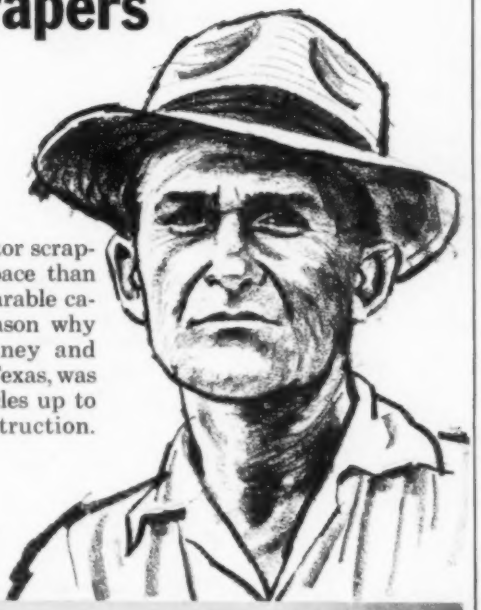
CHRYSLER MODEL IND. 30, six-cylinder engine (230 cu. inch displacement) powers the Coleman aircraft towing tractor, Models G40 and G41. Model G24 is powered by Chrysler Ind. 32 (265 cu. inch displacement). Models G79 and G77AS are powered by Chrysler Ind. 56, V-8 (354 cu. inch displacement).

Send for Chrysler Industrial Engine Catalog.
Includes specifications and performance data for all models. Address: Dept. G9, Industrial Engine Division, Chrysler Corporation, Detroit 31, Michigan.

Chrysler INDUSTRIAL ENGINES
INDUSTRIAL ENGINE DIVISION • CHRYSLER CORPORATION

. . . for more details circle 252 on enclosed return postal card

Cuts cycle time 41% on watershed dams with Allis-Chalmers motor scrapers



Allis-Chalmers TS-260 motor scrapers turn around in less space than any other scraper of comparable capacity. That's one big reason why G. V. Walker of McKinney and Wheelock Co., Corsicana, Texas, was able to reduce hauling cycles up to 41 percent on dam construction. Here are the facts—

G. V. Walker, Supt.
McKinney and Wheelock Co.

These Allis-Chalmers TS-260 motor scrapers save 42 miles of extra travel for McKinney and Wheelock Co. on a Texas earthfill dam because of their ability to make full turns after the dam became too narrow for other scrapers to turn on.

3 earthfill dams . . . 300,000 cu yd moved

Superintendent Walker reports a total of 300,000 cu yd of material moved on three recent Texas watershed dam jobs. On these operations there were three Allis-Chalmers TS-260 motor scrapers. The shorter turning radius of the TS-260's (full turns in 30 ft) allowed Walker to build the dams higher before the scrapers were forced to travel the full length of the dam to turn around.

Saves 42 miles of extra travel

On Project 26, for example, Walker's TS-260's were able to carry 162 more short-haul loads because they continued to make full turns after the dam became too narrow for other scrapers to turn. When the dam reached that critical height, other scrapers required a total haul-return distance of 550,800 ft. The distance traveled by the TS-260's totaled only 324,000 ft . . . saving 226,800 ft or 42 travel miles.

Loaded TS-260 powers its way upgrade to the rising dam.

Besides TS-260 turn-ability, Walker likes the positive, hydraulic, double-action bowl jacks that permit down pressure for fast penetration of hard material. The curved cutting edge breaks up sandy Texas clay, "boils" it into the bowl. Material loads easier and fills every corner for maximum yardage each trip. Positive forced ejection makes fast and accurate spreading.

All in all, G. V. Walker sees his Allis-Chalmers dirt-moving fleet as a real money-maker and work-saver. See for yourself by asking your Allis-Chalmers construction machinery dealer for an on-the-job demonstration. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

Look ahead... *move ahead* ...and stay ahead with **ALLIS-CHALMERS**

. . . for more details circle 239 on enclosed return postal card

ROADS AND STREETS

A GILLETTE PUBLICATION • SEPTEMBER, 1958 • VOLUME 101 • NUMBER 9

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COMING ARTICLES

Several concrete paving project reviews coming soon including one with 8-yard mixer which involved central mixing and dump body delivery.

Watch for more on-the-scenes reports on how some states are doubling or tripling their road job awards this year.

"Knockin' Out the Yardage"—this popular department is being revived and will cover earth and rock grading jobs where the problem and methods were unusual and the performance outstanding.

Also: Alaska's vast future highway needs; score of other timely topics.

Look for this nearby Goodyear dealer sign for better tire values—better tire care.

New SUPER HARD ROCK LUG

Tubeless or Tube-Type

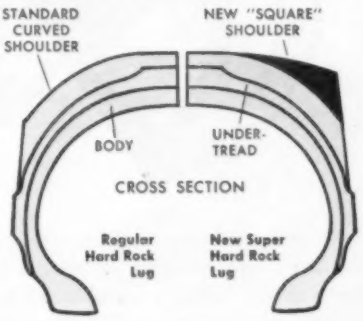
This new SUPER HARD ROCK LUG is *truly* wide-base, from tread–to shoulder–to bead!

BONUS RUBBER–and plenty of it–*right where you need it most.* Result? *Super* traction, *super* flotation, *super* stability–and *super* resistance to shoulder snags and cuts.

Best news of all: *SUPER HARD ROCK LUG costs no more than conventional wide-base off-roaders!* Get more tire for your money! Get this great new wide-base yardage champ at your Goodyear dealer's now.

Goodyear, Truck Tire Dept., Akron 16, Ohio.

SEE HOW DEEPER SHOULDER DEPTH PROVIDES STRONGER BITE, LONGER WEAR:



Built with **TRIPLE-TOUGH 3-T NYLON CORD!**

Like steel, tire cord must be tempered to be tough. Goodyear's exclusive 3-T process, involving Tension, Temperature and Time, triple-tempers cord to make it TRIPLE-TOUGH–to give you longest tire life, lowest cost-per-yard!

GOODYEAR

MORE TONS ARE HAULED ON GOODYEAR TRUCK TIRES THAN ON ANY OTHER KIND

. . . for more details circle 270 on enclosed return postal card

BIGGER PAY LOADS

with OWEN aluminum buckets

The combination of alloy aluminum plate with steel in the bowl construction of material handling buckets . . . 2½ cubic yards and over, eliminates up to 1000 pounds of dead weight. This affords a like amount of increase in pay load when rehandling comparatively light, free-flowing materials.

The exclusive feature of the closing line lead in the center plane of the bucket eliminates sharp bends at the guide sheaves and rollers, thereby increasing the life of the closing cable from 75% to 100%.

Long, internal main-shaft bearings insure permanent jaw alignment with minimum wear. Write for further details.

The OWEN BUCKET Co.
BREAKWATER AVENUE, CLEVELAND 2, OHIO
BRANCHES: New York • Philadelphia • Chicago
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ROADS AND STREETS

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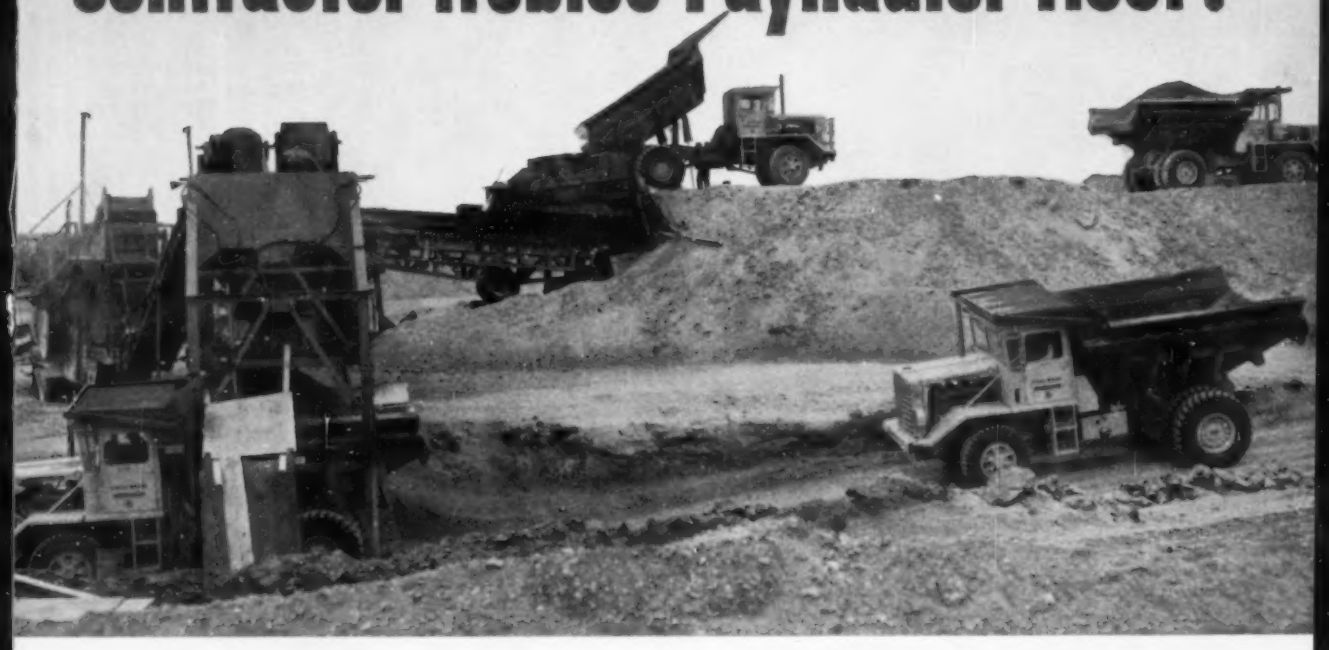
AFTER LOAD-FOR-LOAD COMPARISONS,

contractor trebles Payhauler® fleet!



Producing 380,000 cu. yd. of aggregate for their bypass paving contract (Rt. 277 around Abilene, Texas) Cage Brothers keep six units of their 9-Payhauler fleet busy at this quarry. With three units feeding crusher, and three stockpiling, the plant produces 7,000 cu. yd. of minus 2-in. aggregate daily.

Ton-for-ton and yard-for-yard, the road-building Cage Brothers, San Antonio, Texas, compared International Payhauler production with competitive off-highway rigs. Result: They trebled their "65" Payhauler fleet within a year!

Let Superintendent E. A. Rice give you the details:

"First we bought three Payhaulers and three competitive haulers. When we found it took two of them to equal one Payhauler, we got three more Internationals. Now (with more hauling) we have added another three, to give us nine Payhaulers.

"We've never had better equipment. Payhauler power, speed, and fast dumping cut cycle time. Operators go for Payhauler operating ease and riding comfort."

International Payhauler models give you fast getaway with a bonus of turbo-charged diesel power. They have a gear choice to match every load and road. And they provide the power-cushioning leverage of full-floating planetary drive axles, to minimize the slam-bang shock of off-road full-load hauling!

Try Payhauler "pick-up truck" spotting ease—assured by "zip-around" power steering and exclusive high reverse. Prove full-load ramp-climbing "muscle"—and up to 25% faster haul speeds. See how 7½-second dumping and Payhauler operating ease and safety figure sharply in out-hauling other makes, up to 2-to-1! See your International Construction Equipment Distributor for a demonstration.

With extra-large air brakes, air-assisted clutch, and integral hydraulic steering, the "65" Payhauler gives fingertip operating ease—even when hauling 18-ton loads over rough terrain. This pair is stockpiling aggregate for Cage Brothers.

International® Construction Equipment

International Harvester Co., 180 N. Michigan Avenue, Chicago 1, Illinois

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors . . . Self-Propelled Scrapers . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Haulers . . . Diesel and Carbureted Engines . . . Motor Trucks . . . Farm Tractors and Equipment.

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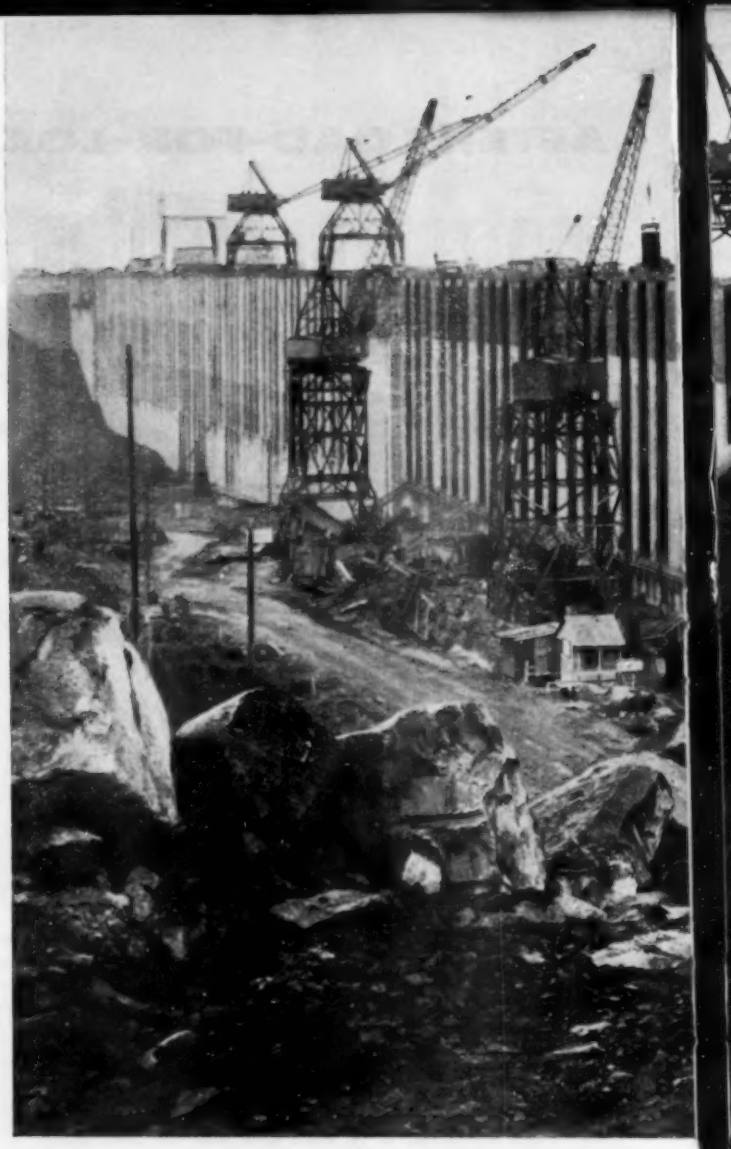

AN ESTIMATED 73% of the petroleum requirements on major St. Lawrence Seaway projects have been supplied by Texaco. Picture shows Bill Partisch (left), Texaco Lubrication Engineer, and Vic Pandolfi, Equipment Superintendent, discussing the Texaco Lube Plan, represented by the numbered barrels. In background, upstream side of Barnhart Island Power Dam and Robert E. Saunders Generating Station designed to generate 1,880,000 kilowatts. Construction of the 3,230-ft. wide, 167-ft. high concrete gravity dam involved excavation of more than 2,500,000 cu. yds. of earth and placing of approximately 2,000,000 cu. yds. of concrete. Dam is a joint project of the Power Authority of the State of New York and the Hydro-Electric Commission of Ontario. Contractors for both U. S. and Canadian sides used Texaco lubricants and fuels, the Canadian contractors being supplied through McColl-Frontenac Oil Co., Ltd., Montreal, a Texaco subsidiary.

NO MORE THAN SIX SERVE ON

Texaco Plan reduces needed lubes to no more than six

MASSENA, N. Y.—Barnhart Island Power Dam is the world's second largest hydro electric project (first: Grand Coulee).

A Texaco lubrication plan and the service that makes it work are credited by the contractor's Equipment Superintendent with playing a significant role in keeping the contractors' equipment in an operating condition.

"The Texaco Lube Plan has really helped," says Victor Pandolfi, Equipment Superintendent for Perini, Walsh, Morrison, Kiewit, Utah Companies, General Contractors. "We've used no more than six high quality lubricants *for the entire project* instead of 15 or 20. There's been less inventory. It's been simpler to service and protect the equipment. We've avoided mistakes in lubrication, and saved manhours and money."

Most Contractors Use Plan

The Barnhart Island Power Dam is just one of the St. Lawrence Seaway projects on which the Texaco Simplified Lubrication Plan has been used. It's estimated that 73% of the petroleum requirements for the Seaway have been supplied by Texaco, and that most maintenance programs have included the Lube Plan.

The Plan has been endorsed for the following reasons: proper lubricants are recommended; less storage needed, reduced confusion and misapplication; lower handling and maintenance costs; less time lost by equipment; fewer lubricating errors; time and money saved.

Developed on the Job, For the Job

The Texaco Simplified Lubrication Plan was developed

THE ST. LAWRENCE POWER DAM

from on-the-job experience in all types of construction work. It's tailor-made for the work to be done. Lubricants may vary from job to job because each Plan is set up to meet the specific needs of a specific project. But regardless of the job, the basic fact remains that—*no more than six lubricants are needed to handle all major lubrication.*

Here are the six lubricants, illustrated above, used on the Barnhart Island project:
(1) For engines: *Texaco Ursa Oil Super Duty Special;* **(2)** for chassis, wheel bearing and general grease lubrication: *Texaco Marfak Multi-Purpose 2;* **(3)** for hydraulic units: *Texaco Regal Oil R&O;* **(4)** for transmissions and differentials: *Texaco Universal Gear Lubricant EP;* **(5)** for wire rope and open gears: *Texaco Crater;* **(6)** for enclosed reduction gears: *Texaco Gear Lube HD.*

Let a Texaco Lubrication Engineer work out a Simplified Lubrication Plan for your project. You'll save time, money and mistakes. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

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LUBRICATION IS A MAJOR FACTOR IN COST CONTROL

(PARTS, INVENTORY, PRODUCTION, DOWNTIME, MAINTENANCE)

Plowing an

- AIRPORT
- PARKING LOT
- CITY STREET
- or EXPRESSWAY—

Think of

FRINK

ONE-WAY with Trip Blade—for high-speed throwing and spreading, but windrows neatly at city speed.

REVERSIBLE Trip Blade — all-purpose; plows left, right, bulldozes ahead; power reverse lever in cab.

ROLL-OVER with Taper Blade—for airports, expressways; rotates left or right in seconds; ends "deadheading."

The Plow Designed for the Power and Performance to Meet YOUR Snow Removal Needs

Whether snow removal problems in your area require a high-speed, heavy-duty V-type plow (**above**) or a lighter, maneuverable Reversible type, Frink has the plow specifically designed to do the job . . . faster, safer, at lower cost.

Frink, the pioneer in advanced snowplow design for 35 years, makes four basic types of plow, each with models to fit 1½ to 12 ton trucks . . . and most are interchangeable on same truck attachment. Get full details from your Frink distributor or write Frink for descriptive folders about any of these plows —

For Snow Plow Know-How
It pays to think of

FRINK SNO-PLOWS

CLAYTON, N. Y.
Frink Snow Plows of Canada, Ltd., Toronto, Ontario

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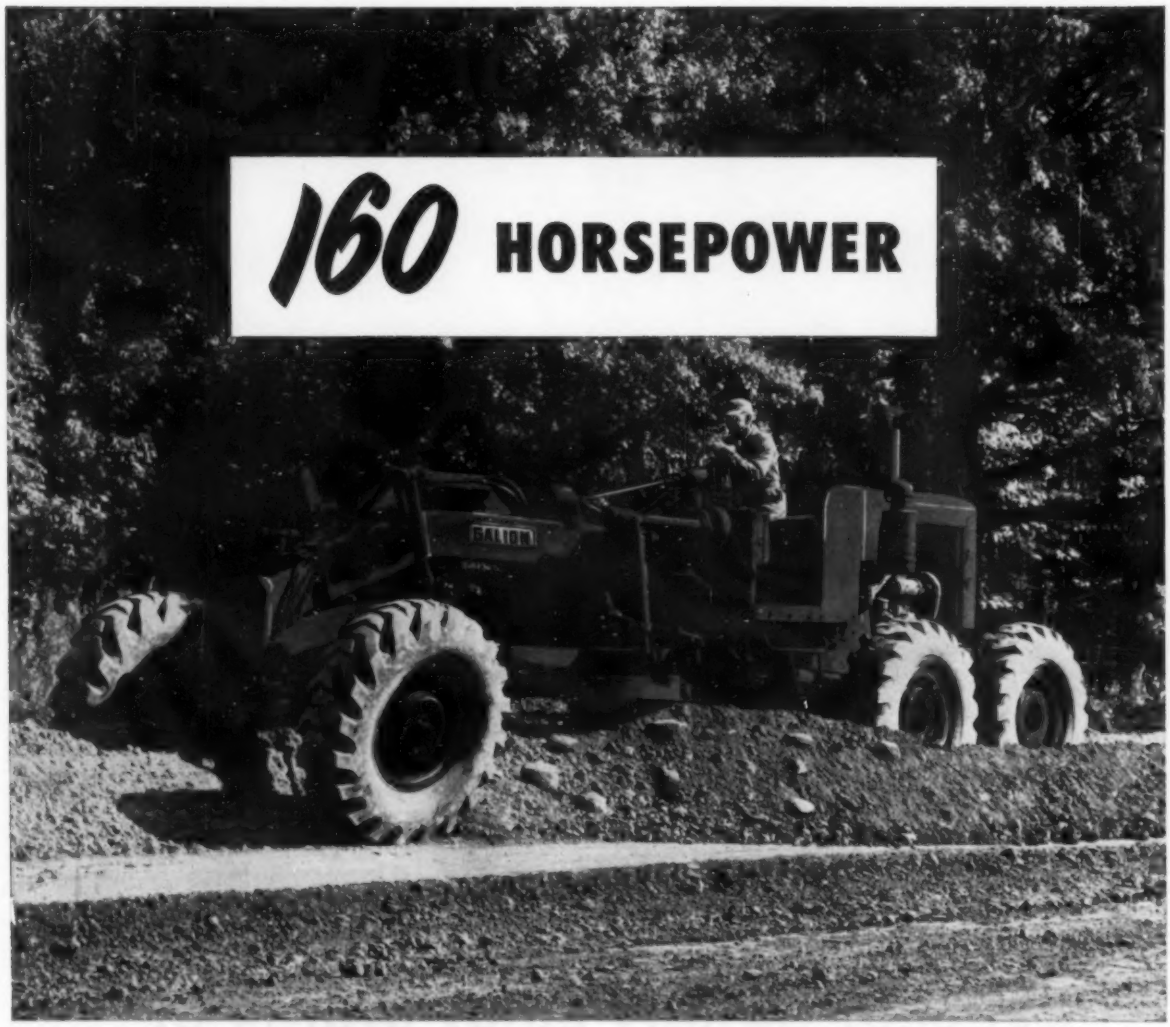

GALION MODEL 160

Six-speed, constant-mesh transmission.
Hydraulic Shiftable Moldboard 13'x29"x¾".

Weight . . . 30,020 lbs.

Available with creeper transmission and Hydra-Tilt moldboard.

Write for Bulletin 421.

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MOTOR GRADERS & ROLLERS

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From Washington to Maine . . .

The number of Bucyrus-Erie crane-excavators owned by Harrison Bros., Tacoma, Washington, is 13, including recently-purchased 30-B and 54-B models. Here, a 1½-cu. yd. 38-B shovel, one of five Bucyrus-Eries on this project, loads rock, dirt, and boulders on a 4.2-mile section of a state highway through Snoquolmie Pass.

W. H. Hinman, Inc., North Anson, Maine, keeps busy on scattered road and street projects in New England. This 25-ton 22-B Transit Crane, one of 11 Bucyrus-Eries owned by Hinman, is unloading steel stringers for use in building an interchange on the New Hampshire Turnpike near Dover.

Repeat owners enjoy profits of Bucyrus-Erie quality . . . you can, too

"Sure we like Bucyrus-Eries, or we wouldn't own a fleet of 'em!" — states the job superintendent for Harrison Bros., Tacoma, Washington. That's the simple way repeat owners express their satisfaction in the year in, year out moneymaking ability of Bucyrus-Erie equipment.

These experienced road-building contractors are just a few of the thousands of Bucyrus-Erie owners across the country who are completely sold on the versatile performance, steady output, low cost maintenance, and dependable long life of these fully convertible crane-excavators. They prove their satisfaction with repeat purchases.

You can start enjoying the same extra profits by putting one or more of these rugged Bucyrus-Eries on your next road job. 468E58

See your distributor today or write direct for the complete story. Bucyrus-Eries are available in a wide range of sizes: from ⅜ to 4-cu. yd. capacities as a shovel, dragline, crane, or clamshell; and from ⅜ to 2½-cu. yd. as a hoe.

A Familiar Sign... BUCYRUS ERIE *. . at Scenes of Progress*

BUCYRUS-ERIE COMPANY · SOUTH MILWAUKEE, WISCONSIN

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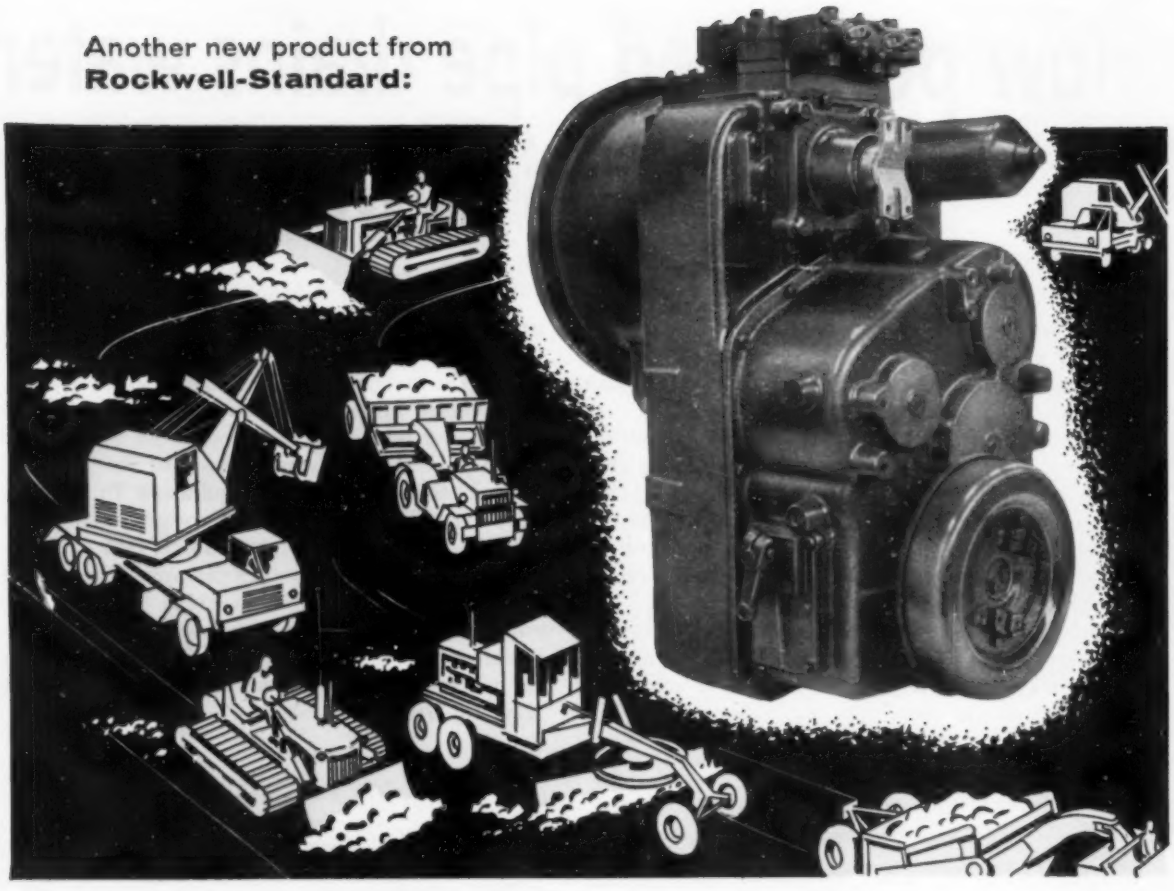
Another new product from
Rockwell-Standard:



HYDRA-DRIVES®
POWER SHIFT TRANSMISSIONS

A torque converter...and 4 speed transmission in one compact package!

Hydra-Drives Power Shift Transmissions put *more* power to work . . . smoothly . . . efficiently . . . economically. Proved in hundreds of vehicles for three years, these units assure top work output of heavy-duty equipment. Engine lugging and heavy shock loads are eliminated. A 3 to 1 torque multiplication makes starting fast and effortless—even with heaviest loads.

Simple to operate, too, a flip of the operator's lever accomplishes power shifts within each range and without any interruption of the power flow. Automatic features of the converter and ease of power shifting simplifies operator training and lengthens vehicle life.

With four speeds forward and reverse, the Hydra-Drives Power Shift Transmission is ideally suited for vehicles which must travel in both directions during a normal work cycle. Rated at 550 ft. lbs. input torque, they can be used with a wide range of internal combustion engines up to 250 H. P.

The Transmission and Axle Division of Rockwell-Standard specializes in drive components only, and *does not compete with manufacturers of end products.* Take advantage of 50 years' experience in the manufacturing of power transmission components, specify Rockwell-Standard.

HYDRA DRIVES
ROCKWELL-STANDARD CORPORATION
TRANSMISSION AND AXLE DIVISION
DETROIT 32, MICHIGAN

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Products of **ROCKWELL-STANDARD** Corporation

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How perforated pipe drains water that seeps upward

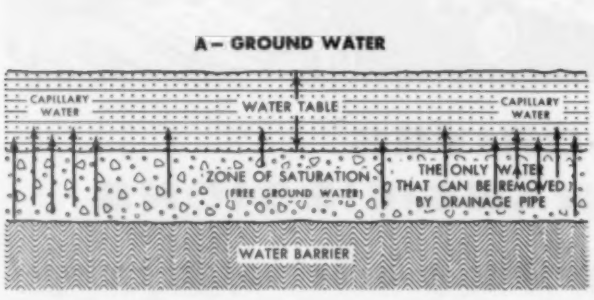
Every good engineer knows the havoc that can be caused by excessive ground water. And much of the trouble can be caused by capillary water that seeps *up* from a reservoir of "free water" underground.

Perforated pipe made from Beth-Cu-Loy galvanized corrugated sheets is very effective in removing free ground water which supplies the capillary water to the subgrade. Properly installed, such pipe collects and removes ground water which first percolates downward by gravity through porous material, then seeps through the perforations into the pipe.

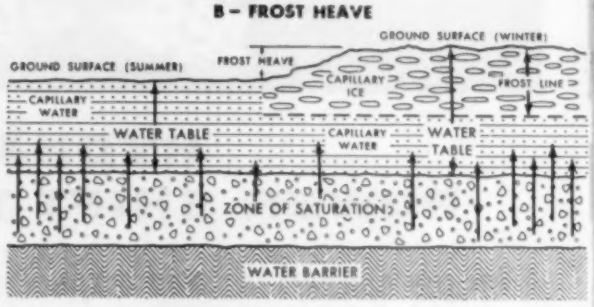
Perforated pipe is placed in a trench of predetermined depth, *usually with the perforations down*. In certain cases a series of parallel trenches is required, particularly where there are wide areas with the ground-water level directly beneath the surface of the ground.

Pipe made from Beth-Cu-Loy sheets is ideal for subdrainage applications. Such pipe is strong, long-lasting and relatively inexpensive. It is flexible, too, which enables it to enlist the aid of the surrounding material to support the imposed loads. In all respects, Beth-Cu-Loy meets the rigid specs of the AASHO.

Bethlehem does not fabricate culvert or drainage pipe. But we do manufacture galvanized Beth-Cu-Loy (copper-bearing steel) sheets which fabricators make into pipe. If you would like further information about Beth-Cu-Loy, or the pipe made from it, just write to the address below and ask for Booklet No. 425-A, "Solving Drainage Problems."

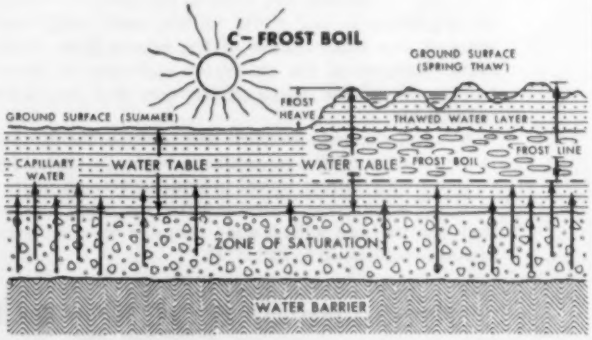


REMOVE FREE WATER. Water that enters the soil from the surface gravitates downward until it reaches the "zone of saturation." As shown in the sketch, this is the only water that can be removed by drainage pipe. However, with this free water removed, the amount of capillary water is greatly reduced since capillary water in the soil depends on the water table, and will fluctuate accordingly.

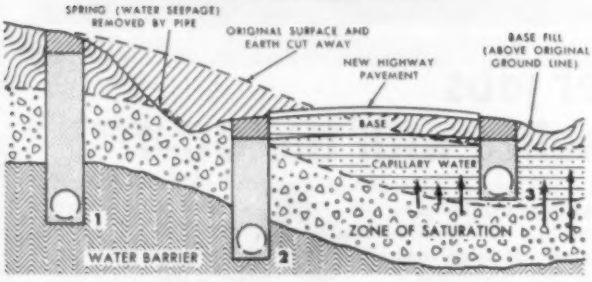


FROST HEAVE RAISES HAVOC. Research indicates that capillary water is the major cause of frost heave. Freezing seems to withdraw water from the soil, and this free water forms free ice. Soil and water become frozen as a mass. More capillary water is attracted to the soil, and is in turn expelled as free ice. This continues until the supply of capillary water is exhausted or cut off by a rapid rate of freezing.

FROST BOIL—ANOTHER VILLAIN. Frost boil acts like an ice barrier, preventing thawed surface water from percolating by gravity to the water table below. Under a pavement, surface soil water can also be sucked up by the pumping action of passing traffic. This water is very harmful because it lowers the stability of the soil in the subgrade, and when the water freezes, it can damage or destroy the surface of the highway.

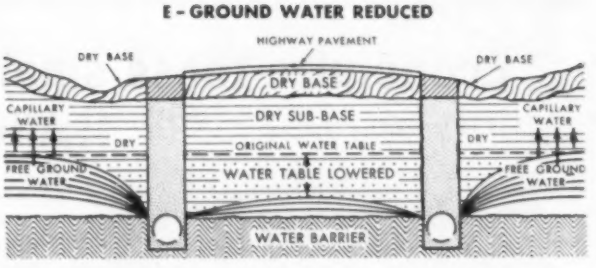


D – CORRECT PLACEMENT OF PIPE



CORRECT PLACEMENT OF PIPE. Pipe 1 will intercept the ground water that became a problem when a bank was cut away during construction of a new highway. Pipe 2 is placed correctly to intercept free ground water on the side of the natural slope. Pipe 3, however, would be ineffectual for two reasons: it is placed on the wrong side of the new highway to intercept the ground water before it reaches the foundation; and the trench is not deep enough to permit the pipe to intercept the ground water under any circumstances.

E – GROUND WATER REDUCED



GROUND WATER REDUCED. Here is an effective use of perforated pipe for lowering the water table. When properly designed and laid in trenches parallel to the roadway, the perforated pipe will draw off ground water, as shown.

For further information about Beth-Cu-Loy, and the pipe made from it, write to the address below for copy of Booklet 425-A, "Solving Drainage Problems."

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA. *On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation*

BETHLEHEM STEEL

BETHLEHEM STEEL

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OLIVER

OC-4 CRAWLER—DIESEL OR GASOLINE

OC-46 Loader is a factory-built, *integral* ⅛-yd. tractor-loader. Rigid subframe. Greatest roll-back (32°) with tremendous break-out force. Has ideal speed range with slow 1½ m.p.h. to fast 5¼ m.p.h. for loader operations. Exceptional balance with 46" track gauge.

Economize those smaller jobs ...dieselize with the OC-4!

You don't have to stand for high costs on those many "medium" jobs any more!

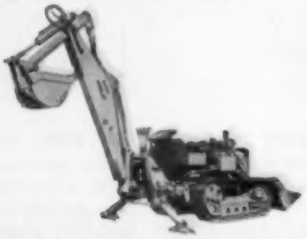
First, the Oliver OC-4 is the only crawler in its class offering diesel power. That means fuel standardization—you can save with diesel even in this popular tractor size!

Second, for all its compact, job-accessible size, the OC-4 performs like larger rigs. By nationally recognized tests, the OC-4 diesel out-powered, out-pulled and out-stepped all other crawlers its size!

Third, the OC-4 is the lowest priced diesel crawler you can buy—for substantial initial savings in addition to important year-after-year operating economies.

Alert users are profiting from the OC-4 by letting this capable crawler do all those jobs where it's uneconomic to tie up larger rigs and wasteful to use less efficient equipment. The OC-4 works with a wide range of front and rear attachments.

Talk to your Oliver distributor about the remarkable OC-4 now—gasoline or diesel models.



Doubly versatile the Oliver loader with Hydro-Jet Trencher. Deep 12'5" digging and rapid work cycle speed all back-hoe work. Trencher attaches and detaches in less than a minute! Also work the OC-4 with these attachments: dozer, angledozer, scarifier, winch, side boom, scraper, etc.

OLIVER

THE OLIVER CORPORATION

Industrial Division, 19300 Euclid Ave., Cleveland 17, Ohio

a complete line of industrial wheel and crawler tractors and matched allied equipment

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Firestones deliver new lows in tire cost-per-hour!

From the New York Thruway to Montana's Hungry Horse Dam, contractors using Firestone Off-the-Highway tires are lengthening hours of service and reducing maintenance costs. One big reason is the extra stamina and strength that Firestone Rubber-X adds to construction equipment tires.

Another reason is the combination of Firestone Rubber-X with exclusive Firestone S/F (Shock-Fortified) nylon cord. Together they help make a tire that helps beat downtime resulting from rapid wear, cuts, snags and impact breaks. Count on Firestones to keep your equipment rolling on the toughest haul or on the tightest schedule.

See your Firestone Dealer or Store and ask the Firestone Tire Sales Expert how Firestone tubeless or tubed nylon off-the-highway tires can cut your tire costs. When you order new off-the-highway equipment, always specify Firestone tires.

FIRESTONE ON-THE-JOB SERVICE—Firestone off-the-highway tire service cuts costs, keeps equipment rolling to keep all jobs on schedule.

TUBELESS OR TUBED
Rock Grip Excavator® W. B. Rock Grip Excavator®

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Firestone

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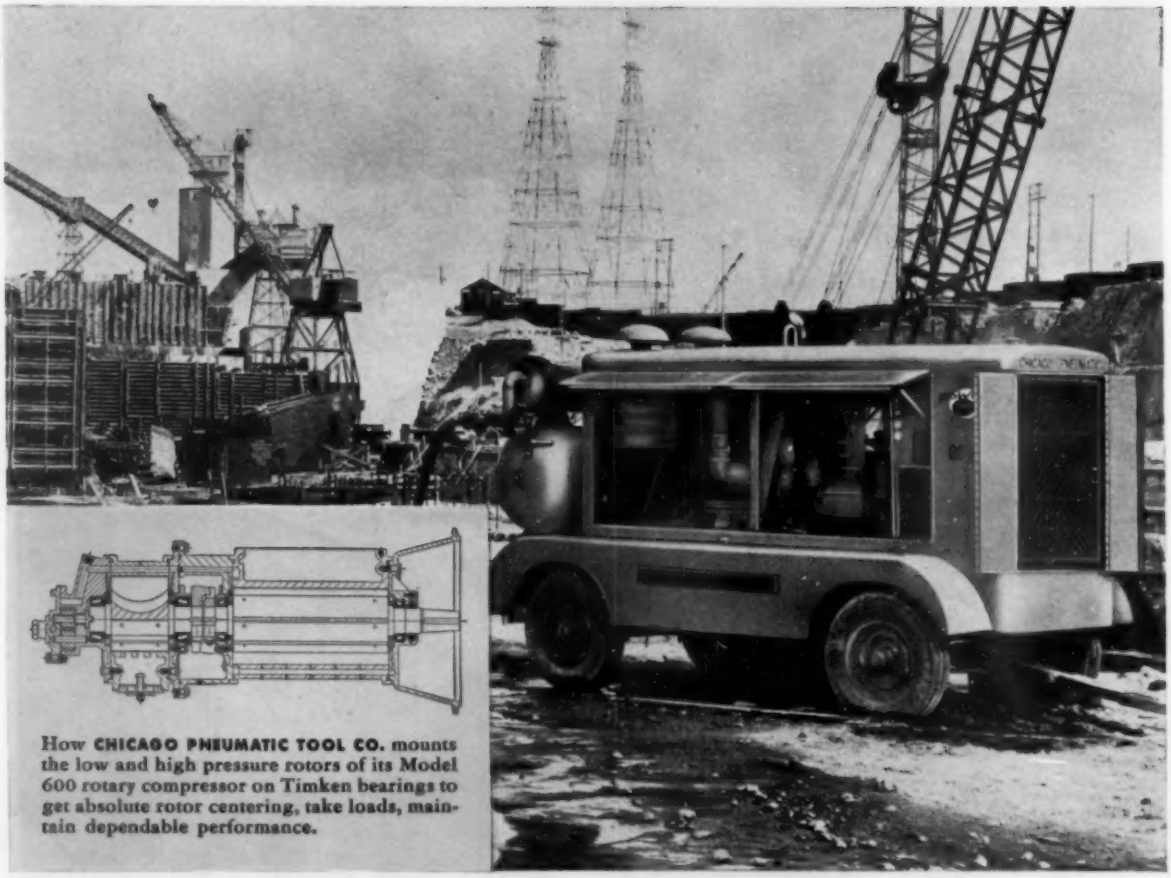
The Firestone Tire & Rubber Company

BETTER RUBBER FROM START TO FINISH

Enjoy the Voice of Firestone every Monday evening on ABC television



How **CHICAGO PNEUMATIC TOOL CO.** mounts the low and high pressure rotors of its Model 600 rotary compressor on Timken bearings to get absolute rotor centering, take loads, maintain dependable performance.

Today contractors get dependable air power—compressor gets perfect rotor centering with TIMKEN® bearings

CHICAGO Pneumatic Rotary Compressors prove themselves to be real workhorses when "killing" construction jobs demand around-the-clock performance with no room for failure. One of the reasons for their success is that Timken® tapered roller bearings keep them rolling.

Each cylinder of these two-stage compressors contains a high-speed rotor that must be perfectly centered between its end plates, and end plate clearances are close. Timken roller bearings prevent any axial movement, yet take radial and thrust loads in any combination.

Timken bearings virtually eliminate friction. They're geometrically designed to have true rolling motion, and precision-made to live up to their design. They make closures more effective, too. Dirt, dust and moisture can't get in; lubricant can't get out. Maintenance is further reduced.

To get the finest bearing steel, we make our own electric furnace fine alloy steel. We're America's only bearing manufacturer that takes this extra step to safeguard quality from melt of steel to finished product.

So to get your No. 1 bearing value, specify bearings trade-marked "TIMKEN". They make any machine better, because Better-ness rolls on Timken tapered roller bearings. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ont. Cable: "TIMROSCO".

This symbol on a product means its bearings are the best.

TIMKEN *TAPERED ROLLER BEARINGS ROLL THE LOAD*

TRADE-MARK REG. U. S. PAT. OFF.

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ROADS AND STREETS
Sixty-Six Years of Editorial Leadership

Washington News Letter

Exclusive - By Duane L. Cronk, Director, Highway Information Services

September 10, 1958

It was touch-and-go last month for the BPR's recent Interstate System cost estimate. The Senate Subcommittee on Roads wrestled several days with the question of whether it was reliable enough to adopt as a basis for distribution of 1961 federal-aid funds to the states. The House had adopted the $39 billion figure without a fuss several weeks previous, thanks considerably to Congressman George Fallon's persuasiveness. Senator Gore, chairman of the Senate committee, had consistently questioned the Bureau estimate, declaring that such a huge committment ought to be thoroughly investigated.

(Late in the last session, Senator Gore had asked the Government Accounting Office to audit the estimate and give him a report on its accuracy. The GAO's report, highly critical of the lack of uniformity in estimating techniques used by the 11 states investigated, stimulated most of the discontent with the national figure.)

Federal Highway Administrator Bertram Tallamy gave an able defense of the states' findings and made a sober appeal for continued flexibility in Interstate System design standards as employed from state to state. The auditors had asserted that "uniformity" cannot be obtained by providing just minimum standards, but that maximum standards should be imposed as well.

Tallamy's argument was that wider shoulders, wider median strips and other such features above the minimum standards immeasurably added to the safety but little to the cost of such construction. He pointed out that local conditions made individual judgment unavoidable and that to freeze design at presently known standards would make experimentation and progress impossible.

* * *

Senator Gore, who has repeatedly asserted that his committee must continue active investigations into the highway program, seemed only partially convinced. But he voted with a compromise proposal to use the estimate for determining apportionments for one more year, 1961. The committee requested, however, that state highway departments get to work on another estimate, using more current construction costs, and have it ready for Senate appraisal within 15 months.

The action means that apportionments of 1961 money can be made anytime after January 1, only four months away, thus giving those states which are out front another chunk of projects to start through the works. Observers at the hearings came away with the distinct impression that state engineers are going to have to be mighty careful with their pencils when they make their next cost estimate, even if Uncle Sam is putting up 90% of the tab. (It came out at the hearing that it took the 48 states and the BPR together 1½ million man-hours to compile the total figure.)

(continued on next page)

Congress adjourns with a good record of highway legislation under the belt. The 1958 Federal-Aid Highway Act boosted money for both the ABC Systems, the Interstate network and public lands roads, created a special $600 million emergency roadbuilding effort, and temporarily lifted the Byrd amendment. The needs formula for distributing federal funds for construction of the Interstate System was endorsed, even if the estimate itself was questioned. An Act to permit right-of-way acquisition seven years in advance of construction, rather than five, sailed through. And a codification act which organized all existing federal highway law under one title was approved.

The legislators again sidestepped the extremely controversial issue of what to do with the toll roads. Most of these will be designated as sections of the Interstate System, but there's high feeling over whether the states involved should be reimbursed for their cost. Nearly $5 billion is at stake. Many Congressmen feel that the money might better be used for new construction rather than for paying states which went ahead on their own toll financing.

* * *

Highway interests here are pleased with the selection of Ellis Armstrong, Utah road commissioner, to be the new commissioner of the Bureau of Public Roads. Armstrong is a construction man, with plenty of field experience. For nearly 20 years after graduation from civil engineering at Utah State, he built dams for the U.S. Bureau of Reclamation and a reputation for himself of getting the job done smoothly. Later, he distinguished himself on international projects - as U.S. consultant on Egypt's Aswan High Dam and as director of dams on the big St. Lawrence Seaway job. For the last year, he has been getting his feet wet in roadbuilding as boss of Utah's state road commission.

Armstrong reportedly will be the bureau's trouble-shooter in its relationships with state highway departments. With a top-notch boss in Bertram Tallamy, an excellent right-hand-man in Francis Turner, and his own background in production, Armstrong has a running start in his new assignment.

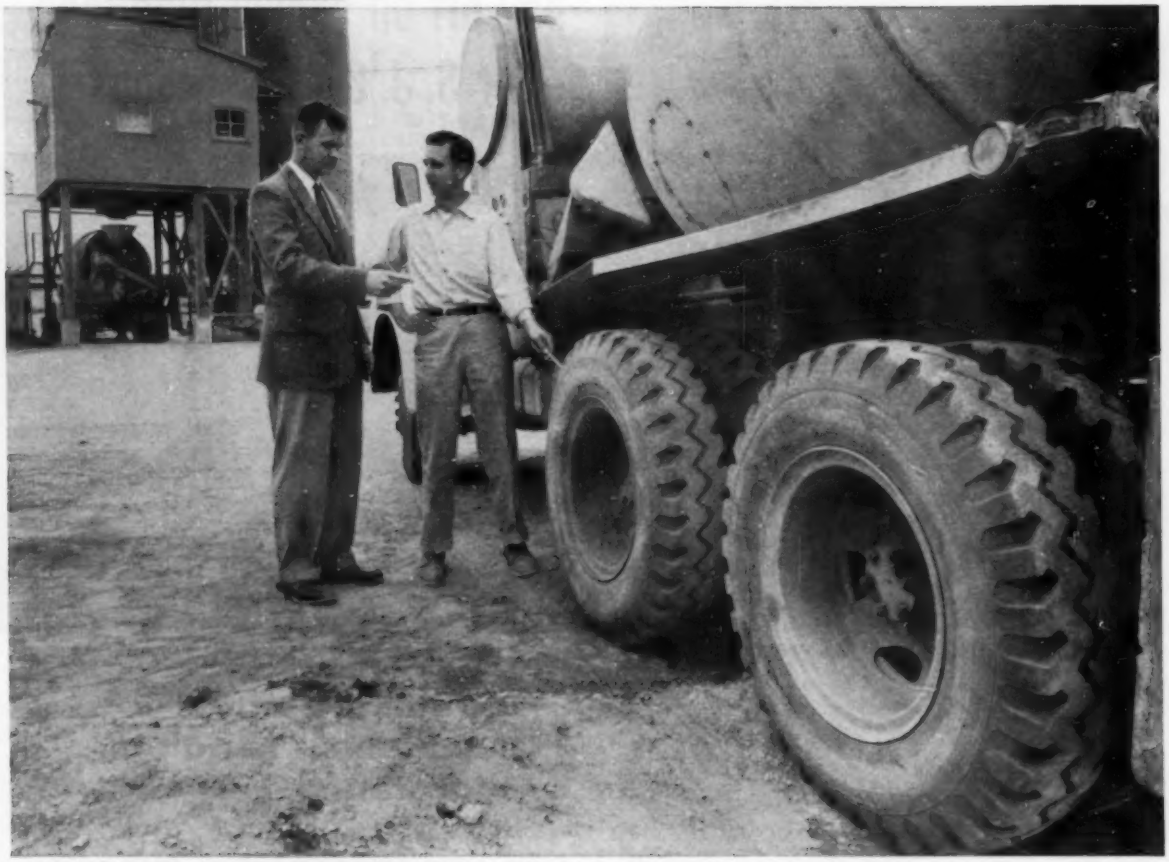
* * *

A new compilation of volumes of aggregates used by state highway departments is available from the Bureau of Public Roads. The table shows tonnage required state-by-state annually (weighted average of three years) per million dollars of construction. It is broken down, also, by System, and as contractor-produced or contractor purchased.

Construction contracts completed on the 41,000-mile Interstate System have passed the half-billion-dollar mark in the two years since the program was launched. In the same period, $2.6 billion worth of contracts have been completed on the regular ABC Systems. Another $1.8 billion worth of work is currently under way on the Interstate System, and $2.2 billion on the other federal-aid systems.

Notes off the cuff . . . Highway construction costs crept up about 1% in second quarter over the first quarter, but were still lower than for the same period last year . . . The Highway Trust Fund started its third year with more than a billion dollars in the till. The federal tax experts were extremely accurate in their forecasting of receipts into the fund. They over-estimated slightly the rate of expenditures . . . ARBA announced last month the formation of a new chapter, the Texas Road Builders Association . . . The big trucks start rolling this month on the $22 million AASHO Test Road in Illinois. Two years from now (after thousands of trips around the test loops) highway designers will have a good idea of how to build for all kinds of traffic . . . Rules governing billboards will soon be released in Washington for those states which want to enforce them and thereby qualify for a bonus in federal aid for their Interstate net.

B.F.Goodrich



B.F.Goodrich Rock Logger tires can be retreaded 3 times, ready-mix company reports

GRAYSTONE of Olympia, Washington specializes in ready-mix concrete. Trucks travel on and off-the-road in stop-and-go service, rolling over such tire-killers as rocks and steel scraps at construction sites. Yet Graystone finds its tires often can be *retreaded 3 times* with practically new tire service from each retread. Why? Graystone uses B.F.Goodrich Rock Logger tires!

Graystone Dispatcher George Meyer says, "B.F.Goodrich Rock Logger tires give the kind of traction we need in rough weather." Husky Rock Logger cleats dig in to give you maximum pulling power in forward or reverse. "They give rugged dependability around rough construction work," he adds.

B.F.Goodrich Rock Logger tires are available with FLEX-RITE NYLON cord construction. FLEX-RITE NYLON withstands double the impact of ordinary cord materials, resists heat blowouts and flex breaks. Result: This B.F.Goodrich cord body outwears even the extra-thick Rock Logger tread, can often be retreaded again and again!

Your nearby B.F.Goodrich dealer is listed under Tires in the Yellow Pages of your phone book. See him today, and start enjoying the extra savings B.F.Goodrich tires give. *B.F.Goodrich Tire Co., A Division of The B.F.Goodrich Co., Akron 18, Ohio.*

Specify B.F.Goodrich Tubeless or tube-type tires when ordering new equipment

B.F.Goodrich *truck tires*

© The B.F.Goodrich Company

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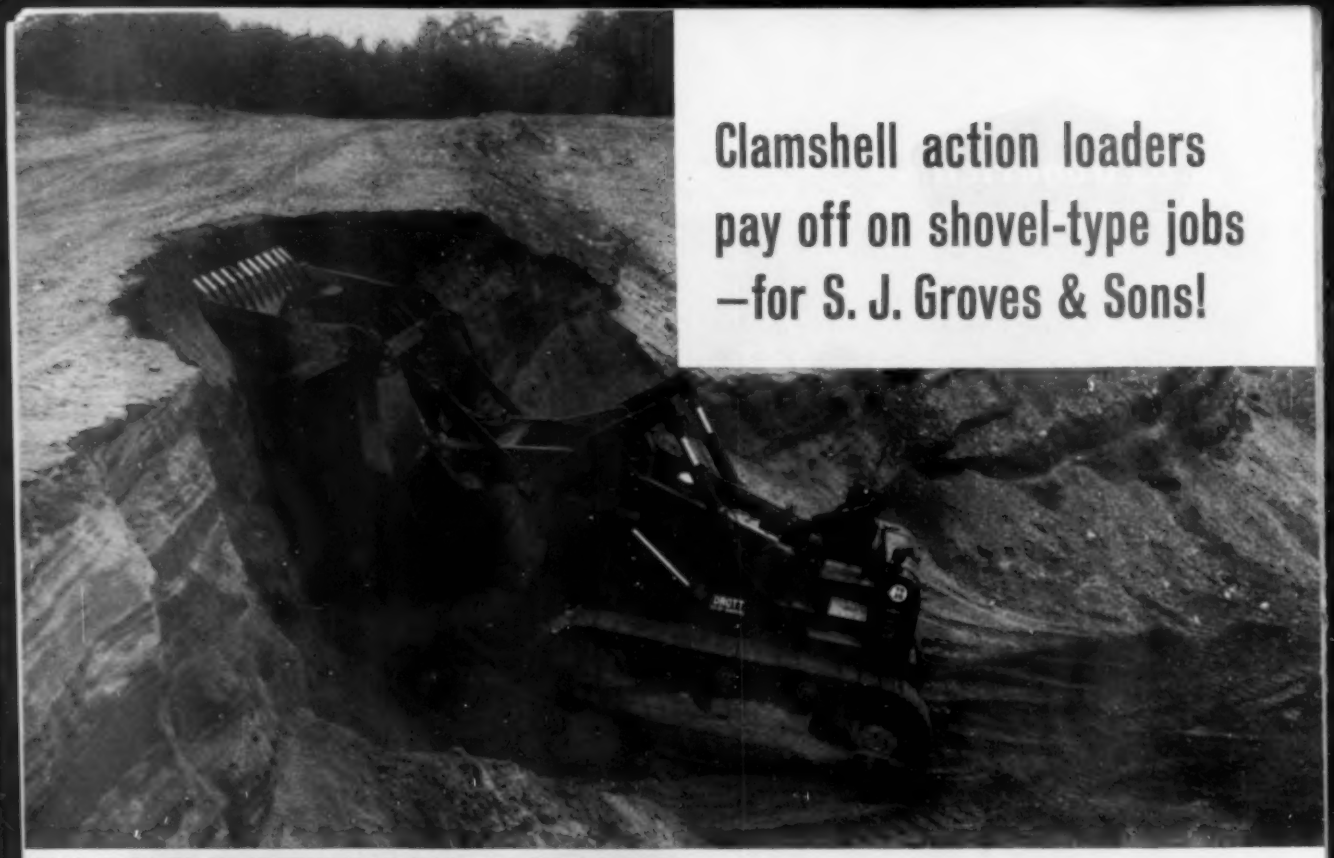
Clamshell action loaders pay off on shovel-type jobs —for S. J. Groves & Sons!



This Groves TD-20 4-In-1 (below) beats dragline excavating-loading production—on airfield construction near Burlington, Wisconsin! The nimble, fast-swinging 4-In-1 delivers a big daily yardage into bottom dumps—gives crawler mobility, 109-inch track stability, and quick TD-20 forward-reverse "Shuttle-Bar" travel speed! The TD-20 4-In-1 shown is filling its bucket with speedy, load-in-place clamshell action.

. . . for more details circle 280 on enclosed return postal card

3-yd multiple-action TD-20 4-In-1's handle BIG job range!

"Back-dragging" with exclusive 4-In-1 clamshell action (above) pulls down highwall—mixes stratified layers—replaces big-capacity, power shovel performance on S. J. Groves & Sons New Jersey highway job. Further mixing by clamshell bottom dumping (at left) produces select fill material. In addition, this TD-20 4-In-1 loads out excess materials all over the project, including stumps and boulders — provides earth-rolling bulldozer action for haul road maintenance, wherever needed! Another Groves 3-yd International Drott 4-In-1 loads out fill on this project!

See what it means to multiply your job range and divide your machine investment by four — with an International Drott 4-In-1! Measure exclusive 4-In-1 advantages like pry-over-shoe break-out action, and shock-swallowing Hydro-Spring. Move the "machine-selector" lever—watch how a 4-In-1 can instantly replace one costly limited-duty machine after another, on job after job. See your International Drott Distributor for a demonstration of versatility unlimited!

International Harvester Company, Chicago 1, Illinois
Drott Manufacturing Corp., Milwaukee 15, Wisconsin

INTERNATIONAL® DROTT®

Our Cover This Month

The front cover this month shows the earthmoving fleet of H. F. Randandt, Inc., of Eau Claire, Wisconsin, during the grading on Highway 27 near Ladysmith, Wisconsin. This contractor handled 500,000 cu. yd. with equipment consisting of one International "55" and two "75" Payscrapers, three TD-24 crawler tractors, two TD-18s and one TD-14.

This picture serves to illustrate two points. One is that a small, compact fleet can move a large earth yardage, as was done here.

The other point is that the relatively shallow cuts in prairie country add up to large yardages per mile for a modern highway. Quantities averaged over 100,000 cu. yd. per mile (deepest cut 21 ft., deepest fill 32 ft.) along the 200 ft. right-of-way.

Lime Stabilization Movie

A modern, low cost method of road base construction is presented in a new 16 mm. sound-color movie entitled "Lime Stabilization of Roads," which was produced by the National Lime Association. This 23 minute educational film shows lime's use in stabilizing marginal clayey soils on projects ranging from Interstate freeways to farm-to-market roads, and including city streets, airfields, and shoulders. Typical construction procedures for both subgrade and base courses are shown.

The movie also demonstrates graphically and by actual field examples how lime changes soil characteristics, such as lowering of P.I. and shrinkage, increasing strength and stability, and expediting construction during wet weather.

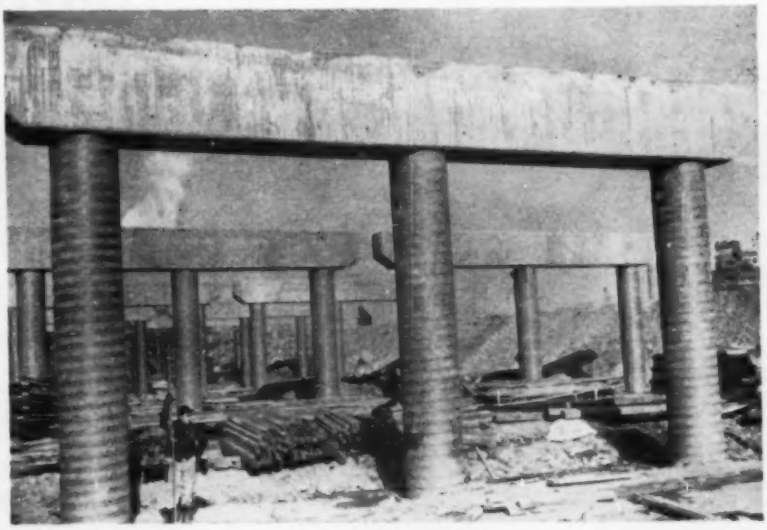
Reservations for showing the film by interested groups may be obtained by sending a request to the National Lime Association, 925 15th Street, N.W., Washington 5, D. C. Prints may also be purchased.

Big Job To Do

The extent of the work cut out for the future in modernizing the highways of Pennsylvania as shown by figures recently released by the Department of Highways: 45 percent of the 12,841 mile primary system is surfaced 18 ft. or less in width, 68 percent of 25,379 mile secondary system is 14 ft. or less, with only 5 percent meeting modern safety standards.

Also a large proportion of the 20,000 bridges on the state's system are not up to standards of safety and geometrics.

Form smoother columns ...easier...quicker!



J. F. Fitzgerald Expressway, Boston, Mass.
M. DeMatteo Construction Company, general contractors

For the smoothest continuous concrete column surfaces, use

SONOCO
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FIBRE FORMS

With the Seamless Sonotube Fibre Forms, columns form better, strip quicker and finish easier! Developed by Sonoco for use where smoother column surfaces are desired, this premium form saves you time, money and labor!

Whenever there's a round concrete column to be finished . . . there's a Sonoco Sonotube Fibre Form to do it . . . faster, and more economically than any other way!

Low-cost SONOTUBE Fibre Forms handle easily and require minimum bracing . . . can be ordered in specified lengths or sawed to size on the job.

Choose the Sonoco fibre form that best fits your requirements . . . the Seamless Sonotube, the patented "A" Coated Sonotube (standard form for finished columns) or the "W" Coated Sonotube (for columns where finishing is not required).

Order in sizes from 2" to 48" I.D. in standard lengths of 18 ft. Other lengths can be furnished to meet special requirements.

See our catalog in Sweets

For technical information and prices, write

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SONOCO
Construction Products
SONOCO PRODUCTS COMPANY

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Contractors report NEW TD-20's are

with new power...

In Washington, D. C., a pair of International Drott TD-20 Skid-Shovels operate double-shift—on the Shannon Construction Company ½-million cu. yd. excavating sub-contract for the new House of Representatives office building. Much of the time, the TD-20's are digging and loading gummy clay. "In my opinion," states Contractor W. D. Shannon, "the TD-20 Skid-Shovel is the only loader with the clearance, pry-out action, and fast operating travel and lift to do this job successfully. The TD-20 'Shuttle-Bar' has speeded up the operation, and so has its ease of handling."

increasing production up to 50%

new speeds..."Shuttle-Bar" control!

Modernizing a 10½-mile stretch of Louisiana 313, Contractor M. T. Bradley, Kentwood, Louisiana, makes use of new TD-20 speed and capacity—to clear right-of-way; doze heaping blades of water-logged soil to hurry drying; and as a pusher. "The TD-20 will load a 15-yd. rubber-tired hauler, in 75 ft. and in 25 seconds (average)," reports Mr. Bradley.

It's the combination of 134 hp, six forward and reverse speeds with "single-stick" shift, and rapid "Shuttle-Bar" direction-changing—that account for amazing work capacity in the new TD-20! You've got an instantly available forward and reverse speed range for every load, condition, and operating situation.

On dozing, push-loading, powering front-end loader—wherever owners take advantage of the new TD-20's greater hp and the new speed of applying it—they're setting new performance records for crawlers of this size range!

In certain instances, the new TD-20 is increasing material-moving production as much as 50%—compared to competitive crawlers!

See how TD-20 shifting and "Shuttle-Bar" direction-changing with just a sweep of the hand speed dozing and loading cycles. Measure how new TD-20 handling ease and response can boost your daily yardage and operator efficiency. See your International Construction Equipment Distributor for a demonstration!

This new International TD-20 powering the Bullgrader blade full of "dead" sandy soil clears land, roughs out right-of-way, and acts as pusher for a fleet of rubber-tired haulers. It's working on the F. C. Herling road-building job, near Franklin, Texas. "We like the TD-20 very much because it is fast, and will put 18 yards of dry, sandy dirt on a scraper in only 40 seconds," states Job Superintendent Bricker!

"The TD-20 can doze up to 50% more material per load than the comparable-sized crawler it replaces—and it's faster both in forward and reverse," states Walter Folger, president, C&F General Contracting Co., Inc., Shamokin, Pa. "The TD-20 has been the most effective tractor we have used." And the TD-20's operator adds: "The forward-reverse 'Shuttle-Bar' boosts our yardage, and doesn't work me so hard."

International® Construction Equipment

International Harvester Co., 180 N. Michigan Avenue, Chicago 1, Illinois

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors . . . Self-Propelled Scrapers . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Haulers . . . Diesel and Carbureted Engines . . . Motor Trucks . . . Farm Tractors and Equipment.

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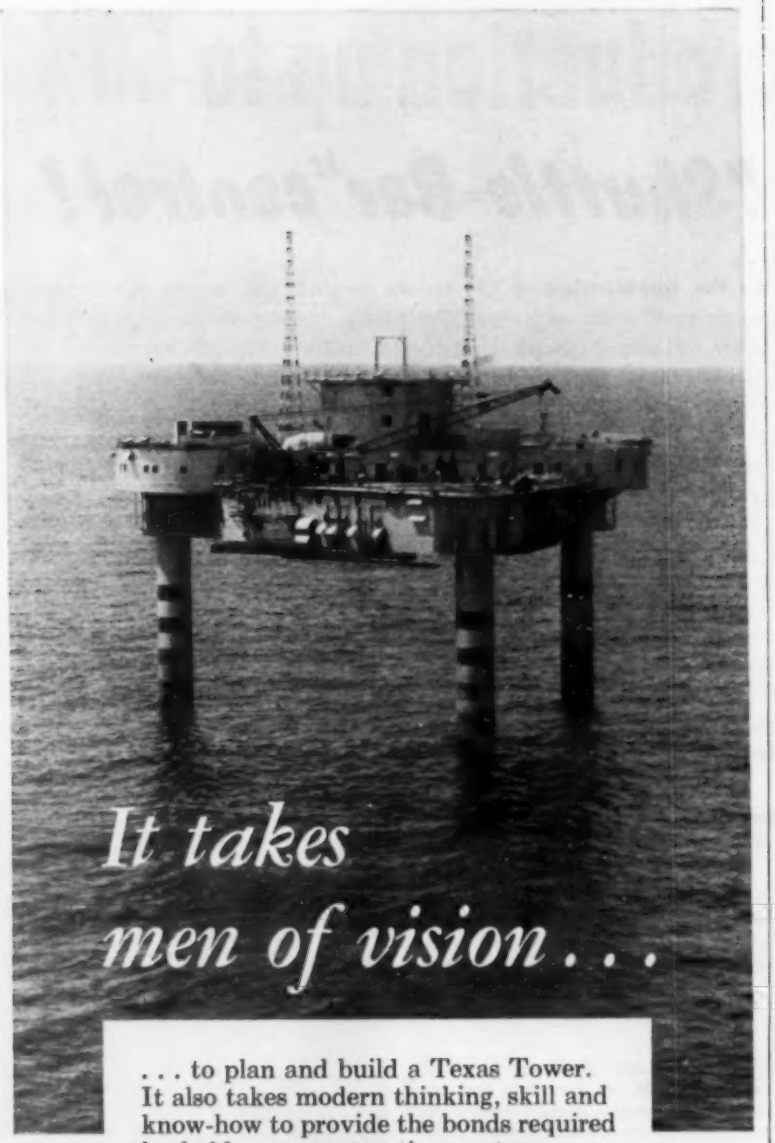

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THE FIDELITY AND CASUALTY COMPANY OF NEW YORK continues, year after year, to keep pace with progress—providing all kinds of bonds and insurance—for all types of construction projects —in all parts of the world.

The Fidelity and Casualty Company of New York

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A Member Company of America Fore Loyalty Group

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New Publications

Book Format for Proceedings of Prestressed Congress

The Cement and Concrete Association of Great Britain has announced immediate availability of the "Proceedings of the Second Congress of the Federation Internationale de La Precontrainte (Internal Prestressing Federation)."

This 990-page book, over 2½ years in preparation, comprehensively treats new developments in prestressed concrete since the First Congress in 1953.

Engineers from 30 different countries attended the Second Congress held in Amsterdam in 1955. The Proceedings include all papers, general reports, discussions and other congressional communications in the language in which they were presented at the Congress--English, French or German. General reports and communications are in all three languages.

The Proceedings cover the following topics: function of grouting and anchorages in the behavior of prestressed elements; experience and problems concerning the manufacture and use of steel for prestressing; progress of precast, prestressed work in the factory and the assembly by prestressing on the site of precast units; moment distribution in statically indeterminate prestressed structures beyond the elastic phase; and influence of plasticity on the strength and instability of thin prestressed shells.

An additional section contains a comparative analysis of specifications in various countries, and statements on the economic advantages of prestressed concrete.

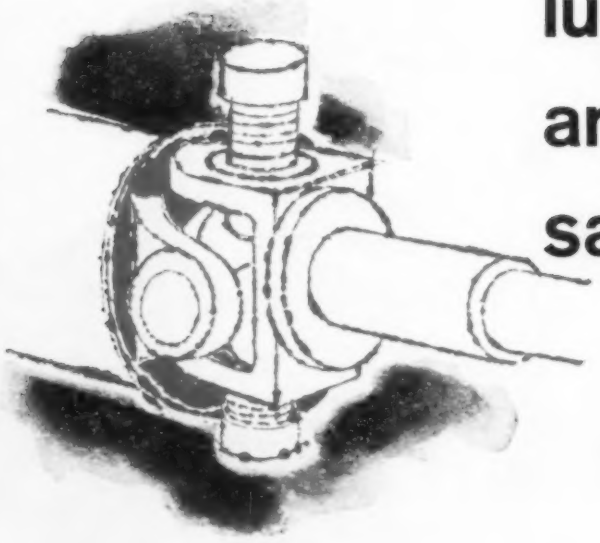
The Proceedings form one large bound volume. Post-free copies may be obtained in the U.S. by making a $15 check payable to the Cement and Concrete Association, address: Federation Internationale de la Precontrainte, Terminal House, Grosvenor Gardens, London, S.W. 1, England.

MAINTENANCE TIPS FOR UNPAVED ROADS. Informative booklet available on request to Calcium Chloride Institute, 909 Ring Bldg., Washington 6, D.C.

It contains charts and tables and chapters on best procedures for maintaining a smooth roadway and

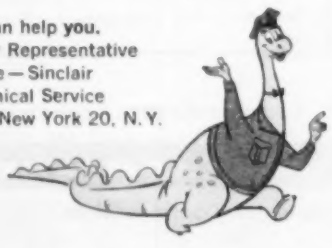
(Continued on page 29)

Universals... lubrication... and how to save money



Sinclair Litholine® multi-purpose grease replaces 3 different ordinary greases—chassis, wheel bearing, water pump. It therefore cuts unnecessary inventory costs. Furthermore, it eliminates the danger of misapplication. This superior lubricant has earned a reputation for lengthening lube intervals—prolonging life of universals and other vital parts. Change to Litholine, now. And when management asks how you've cut costs, tell them you've switched to Sinclair— and show them the results.

Find out how Litholine can help you. Call your nearest Sinclair Representative or write for free literature—Sinclair Refining Company, Technical Service Division, 600 Fifth Ave., New York 20, N.Y. There's no obligation.



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New Rex Car Unloader gives 100% faster cement delivery!

Now... move your cement by *screw*—cut your car unloading time in half over bucket elevator methods!

The new Rex Car Unloader is the fastest, lowest-cost means yet developed—and the simplest. One horizontal and one vertical screw are all that's used for cement handling, eliminating hundreds of separate parts and trouble points of older bucket elevator designs.

In this Illinois Tollway installation, they are unloading a 400 barrel cement car every 40 to 50 minutes. Ten-ton trucks are loaded in 4 to 6 minutes. This single Rex Car Unloader alone supplies cement for an 1800 barrel batching plant!

Smaller in size yet higher in capacity than other types of unloaders, this advanced new Rex unit is more easily moved, faster to set up. It has smoother, far simpler and quieter operation; costs less to maintain. Power is supplied by a 60 h.p. gasoline engine with V-belt and sheave drive. Available in 9″, 10″, 12″ or 14″ screws.

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New Publications

(Continued from page 26)

preserving aggregate materials in various seasons of the year, utilizing calcium chloride as a binding and stabilizing agent.

VEHICLE PERFORMANCE AS AFFECTED BY PAVEMENT EDGE LINES AND TRAFFIC SIGNALS. Bulletin 178. Price $0.60. Highway Research Board, 2101 Constitution Ave., Washington, D.C.

Contains two papers presented at the Board's 36th Annual Meeting.

(1) "Platoon Movement of Traffic from an Isolated Signalized Intersection," by Brian J. Lewis. Data of the extent to which motor vehicles remain bunched together when traveling freely down a semi-expressway type of facility after having been formed into platoons by an isolated signalized intersection. A method is suggested for coordinating the timing of a second traffic signal to afford less delay to the traffic stream.

(2) "Pavement Edge Lines on 24-Foot Surface in Louisiana," by I. L. Thomas, Jr. Concludes that the psychological effect on a majority of vehicle drivers is the only benefit from pavement edge lines, and that the tendency of vehicles to move toward the center of edge striped pavements does not appear sufficient to create any abnormal hazard on a 24-ft. surface.

AIR PHOTO AND SOIL MAPPING METHODS: APPRAISAL AND APPLICATION, BULLETIN 180. Price, $0.80. Highway Research Board, 2101 Constitution Ave., Washington, D.C.

Contains two papers presented at the Board's 36th Annual Meeting, together with a listing of the current USGS activities in geologic mapping throughout the United States and its territories.

Included in the USGS activities listing are tables of available geologic map indexes, projects of the Geologic Division, project of the Ground Water Branch of the Water Resources Division, and the names and locations of the several state geologists.

APPLIED MATHEMATICS FOR ENGINEERS AND PHYSICISTS, by Louis A. Pipes. 723 pages; $8.75. McGraw-Hill Book Company, 330 West 42nd Street, New York 36, N.Y.

HUBER-WARCO
motor graders

only $5 a month on parts

Lothridge Brothers Construction Company of Gainsville, Ga., have given their Huber-Warco 5D-190 a good workout, during the past year and a half, in the rugged mountainous region of north Georgia. During that time, replacement parts have averaged only $5 a month. "When we bought the 5D-190 we bought less than $100 worth of replacement parts," said Ray Lothridge, "and to date only a few of these parts have been used." A performance like this is not uncommon among other 5D-190 owners. The Huber-Warco 5D-190, with torque converter, has been designed to handle big volume grading efficiently and economically. Your Huber-Warco distributor can give you complete details . . . contact him today.

Products of HUBER-WARCO COMPANY, Marion, Ohio, U. S. A.

HUBER-WARCO COMPANY, Marion, Ohio, U.S.A.
Send specifications on the Huber-Warco
☐ 5D-190 ☐ other motor graders
Send specifications on: ☐ Maintainer
☐ Tandem Rollers ☐ 3-Wheel Rollers

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HUBER W WARCO

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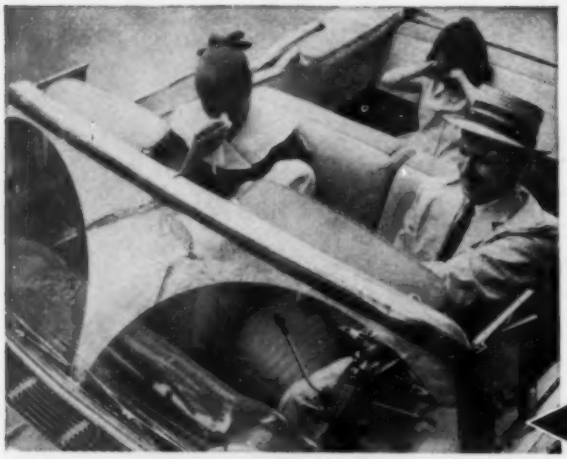

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COLUMBIA CALCIUM CHLORIDE

You can sit down and plan *right now* how to make your maintenance jobs a lot easier for the next six months. Figure needs, cost, dependability, service . . . and you'll come out with COLUMBIA CALCIUM CHLORIDE. Look at how this long-accepted, versatile helper works for you to:

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Dust can be at its worst after the dry summer months. "Sweetening" applications of COLUMBIA CALCIUM CHLORIDE lay dust effectively, prevent further loss of material. Motorists, homeowners, business establishments, livestock, crops—all do better when you control choking end-of-summer dust.

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No other material works with and extends your abrasives like COLUMBIA CALCIUM CHLORIDE. Its fast, uniform melting action helps abrasives to imbed in slick surfaces. The melting and grinding actions that result open roads and streets for *safe* traffic hours sooner. And COLUMBIA CALCIUM CHLORIDE keeps stockpiles workable in freezing temperatures.

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Court Decisions for Contractors

Decision on Subletting

A New York Court, in Lenart Constructors, Inc. vs. State of New York, 165 NYS 2d, 407, ruled on a case involving the same specification clause requiring the prime contractor to (a) perform 50% of the contract with his own forces; (b) secure permission to sublet any work. The contractor received permission to sublet work amounting to approximately that percentage but was refused permission for other subcontracts. He completed the work and entered suit against the State of New York to recover damages for refusal to permit him to subcontract other portions of the work.

The Court held that the contractual provisions of the contract were valid and that he acquired a right to sublet only by the expressed consent of the Superintendent of Public Works. Further, the Court states that this consent was limited to not more than 50% of the work. Therefore, ruled the Court, such refusal could not be either a failure to perform an act promised or a prevention or hinderance of performance which the claimant (contractor) had agreed to deliver. Thus there could be no breach by the State (Restatement of the Law of Contracts, Sec. 312.)

Material Transportation Tax for Government Jobs

The Federal District Courts have had a recent case regarding the application of the 3% transportation tax on materials hauled to a contractor performing work for the highway department of a state. The hauling was performed by an independent trucker and though he had not been designated by the state, the court ruled that the work was "incident to and an integral part of the road construction."

A rather different interpretation was placed on another phase of hauling in Shotwell, USDC, W. D. Wash 11/23/56, in which case the court held that merely transporting gravel from a source of supply to stockpiles was not, by itself, an integral part of a government construction project and was, therefore, subject to the tax.

HUBER-WARCO
tandem rollers

H-W tandem on Connecticut Turnpike

Two Huber-Warco TANDEM ROLLERS have been used by D'Addario Construction Company of Bridgeport, Connecticut, to put the finishing touch to 20,800 tons of bituminous concrete in the Fairfield-Bridgeport area of the Connecticut Turnpike. These two rollers handled the paving of bridge ramps, approaches, dividers and shoulders. D'Addario has also used the two Huber-Warco TANDEMS in many other paving jobs in the Bridgeport area, and like the dependable performance of the units. They also own a Huber-Warco variable weight 3-WHEEL ROLLER that has recently been used for seal coating. A Huber-Warco TANDEM ROLLER can play an important part in your "profit-paving" operation. See your Huber-Warco distributor for complete details.

MOTOR GRADERS

TANDEM ROLLERS

3-WHEEL ROLLERS

MAINTAINER

Products of HUBER-WARCO COMPANY, Marion, Ohio, U. S. A.

HUBER-WARCO COMPANY, Marion, Ohio, U.S.A.
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LACLEDE WELDED WIRE FABRIC holds resurfacing jobs in place

St. Louis County's Brentwood Boulevard gets rugged treatment from the constant parade of cars, trucks and buses. But Laclede's welded wire fabric helps this new resurfacing job weather the barrage of wheels.

Laclede's welded wire fabric holds the resurfacing material securely . . . reinforces it against creep and surface deterioration. Even at bus stops the movement and gouging of the pavement is minimized.

CONTRACTOR:
Kelly Bros. Contracting Company
St. Louis County, Missouri

USE THESE LACLEDE HIGHWAY STEELS FOR REPAIR WORK . . . AND FOR NEW CONSTRUCTION

welded wire fabric
welded dowel spacers
multi-rib round reinforcing bars
center joints
recess joints
tie bars
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LACLEDE

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SAINT LOUIS, MISSOURI ◆ Producers of Steel for Industry and Construction

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Highway Lighting

Need Fixed Policy on Highway Lighting

From the paper "Policies Affecting Interstate Design," by Joseph Barnett, Deputy Assistant Commissioner for Engineering, Bureau of Public Roads; presented at the conference of the New York State Association of Highway Engineers, Rochester, New York, March 27, 1958.

Many miles of the Interstate system doubtless will have fixed source lighting. It is unfortunate that we do not have a sound basis for justifying fixed source lighting. State highway administrators are hard headed business men, as they should be to carry out their public trust, and they must be convinced that an investment in lighting will bring a fair return to the public. The investment is large. Minimum values are $40,000 per mile for first cost and $4,000 per mile per year for maintenance and operation, but these figures are challenged as too low by many who claim they should be doubled or tripled.

The return on this investment is made up of several forms of benefit to the public. Intangible benefits are possibly greater use of the highway at night, some increased ease of policing, pleasing appearance and greater comfort in night driving, although many challenge the last benefit. The tangible benefit is reduction in accidents. Unfortunately there are no data on accident experience at night comparing similar controlled access highways with and without fixed source lighting. The literature is replete with such data for streets and highways without access control where the value of lighting is justified anyway because the intangible benefits are so great.

Bear in mind that a properly designed highway on the Interstate system has no pedestrians, no crossings at grade, a wide planted median so that headlight glare is minimized and adequate shoulders so that few vehicles will ever stop on a through-traffic lane. There may be justification for lighting at interchanges and in densely populated areas where interchanges are frequent, vandals or children may roam across the highway despite fencing, and contrast with lighted streets may be objectionable; but until data on accident experience are available we are dealing with conjecture.

HUBER-WARCO

maintainer

grading inside a building framework

The Huber-Warco M-52 MAINTAINER offers many advantages, including the ability to work in tight places. Here the MAINTAINER is working inside a building framework where it would be impossible for a big grader to maneuver. The MAINTAINER is a 45½ h.p. unit . . . weighs almost 7,000 lbs. . . . and features a torque converter. Contractors like this versatile machine . . . with hydraulically controlled attachments it will also perform service as a bulldozer, lift-loader, broom, snow plow, berm leveler or patch roller. See your Huber-Warco distributor for a demonstration of the "profit-making" M-52 MAINTAINER.

3-WHEEL ROLLERS

MAINTAINER

MOTOR GRADERS

TANDEM ROLLERS

Products of HUBER-WARCO COMPANY, Marion, Ohio, U. S. A.

HUBER-WARCO COMPANY, Marion, Ohio, U.S.A.
☐ Send specifications on the Huber-Warco M-52 Maintainer.
Send specifications on: ☐ Motor Graders ☐ Tandem Rollers ☐ 3-Wheel Rollers

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HIGH LIFTS or LOW LIFTS

they're easier with a NORTHWEST!!!

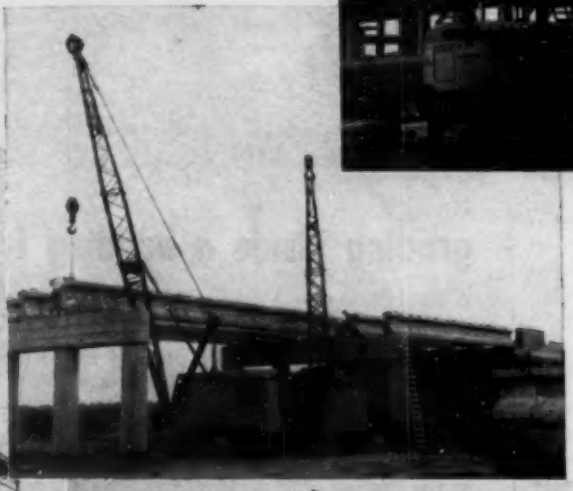
● Go through the whole Northwest Machine—any model from the big 95 to the Model 25! Booms!—sturdier for workhorse lifting—Uniform Pressure Swing Clutches for smooth swinging, and accurate spotting . . . cool running, trouble-free!—the "Feather-Touch" Clutch Control with the "feel-of-the-load," free of the complication of delicate mechanisms, valves, pumps and compressors,—a choice of Boom Hoists including the Northwest Independent High Speed Boom Hoist, a rugged unit capable of trouble-free service in hour after hour operation—a wide range of other equipment including Pivoted Gantries, Removable Counterweight, Sectional Boom Hoist Rigging and Pendant Lines, Telescopic Boom Struts, Adjustable Jibs, extended Boom Point Sheave Shafts, and 3rd Drums that make possible three load lines.

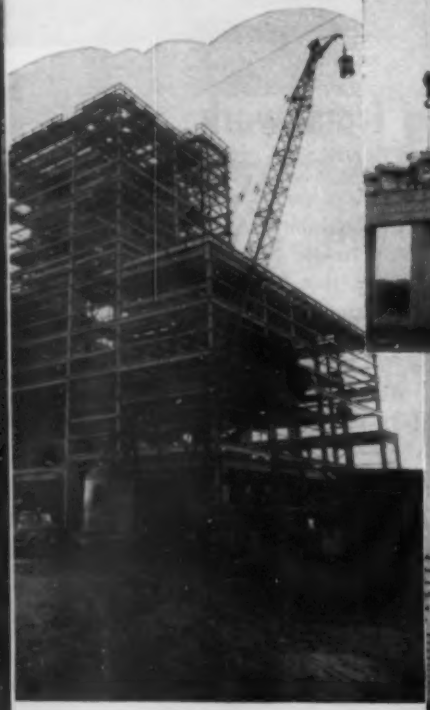
Add to this that Northwest quality of "always being ready to go." *We hear it everywhere and Northwest users will tell you so.* It's the big reason why Northwests are money makers.

NORTHWEST ENGINEERING COMPANY
1504 Field Bldg., 135 South LaSalle Street, Chicago 3, Illinois

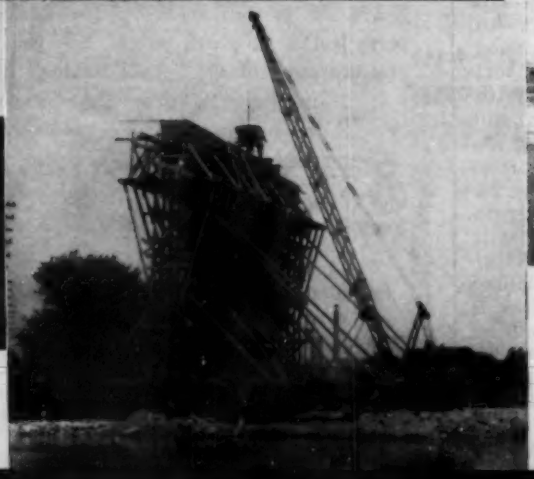
A big Northwest 80-D makes an easy job of pouring. Plenty of boom and the jib make placing easy over a wide area of floor.

Right: Two Northwests coordinate smoothly to place a heavy precast concrete beam.





Above: High floors are no problem with a Northwest.



Above: Pulling sheeting, jetting or driving piles or sheeting is all in the day's work for a Northwest.

Left: A Northwest Model 41 pours smoothly to forms for a bridge pier.

NORTHWEST *Always Ready to* GO

NORTHWEST EQUIPMENT IS BUILT IN THE FOLLOWING SIZES

SHOVELS	CRANES	DRAGLINES	PULLSHOVELS	TRUCK CRANES
¾ Yd. to 2½ Yd. Capacity	13-Ton to 50-Ton Capacity	¾ Yd. to 3 Yd. Capacity	¾ Yd. to 2½ Yd. Capacity	25-Ton and 35-Ton Capacity

G-71-1

Meetings

National County Conference Set for Sept. 29-Oct. 1

The sixth annual National Highway Conference for County Engineers and Officials, sponsored by the American Road Builders Association, will be held at the Concord Hotel, Catskill Mountain resort on Kiamesha Lake in upstate New York, Sept. 29-Oct. 1.

A thousand delegates are expected to attend the meeting to hear several of the nation's highway experts discuss developments as related to county and local highway administration.

FREEWAY OPERATIONS SEMINAR—Institute of Traffic Engineers, Northampton, Mass; September 24-26.

AMERICAN PUBLIC WORKS ASSOCIATION—Annual Meeting, Muehlebach Hotel, Kansas City, Mo.; September 28-October 1.

CANADIAN GOOD ROADS ASSOCIATION—39th Convention, Queen Elizabeth Hotel, Montreal, Canada; September 30-October 3.

CONFERENCE ON ROADSIDE DEVELOPMENT, Ohio Department of Highways and Ohio State University, Columbus, Ohio; October 7-10.

AMERICAN SOCIETY OF CIVIL ENGINEERS—Annual Convention, Hotel Statler, New York, N.Y.; October 13-17.

REMINGTON RAND UNIVAC USERS CONFERENCE—Meeting at Office of John Hancock Mutual Life Insurance Co., Boston, Mass.; October 20-21.

NATIONAL SAFETY COUNCIL—46th Annual National Safety Congress and Exposition, Conrad Hilton, Congress, Morrison, La Salle hotels, Chicago, Ill.; Oct. 20-24.

NATIONAL SLAG ASSOCIATION—41st Annual Meeting, Mayflower Hotel, Washington, D.C.; October 21-22.

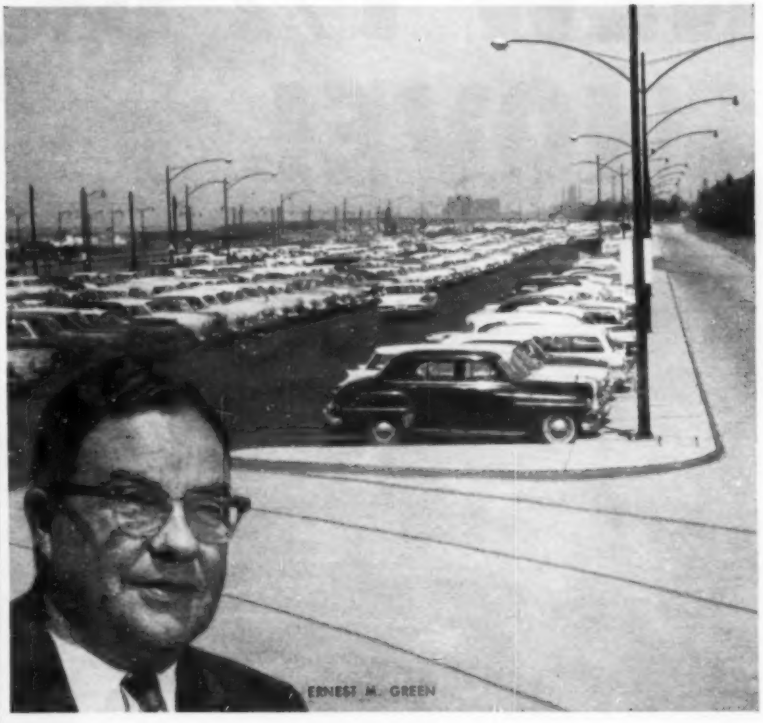
NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS—Fall Meeting, St. Francis Hotel, San Francisco, Calif.; October 23-25.

INTERNATIONAL ROAD FEDERATION—Third World Meeting, Mexico City, Mexico; October 26-31.

AMERICAN CONCRETE INSTITUTE—1958 regional meeting, Detroit, Michigan; October 27-29.

INSTITUTE OF TRAFFIC ENGINEERS—28th Annual Meeting, Deauville Hotel, Miami Beach, Fla.; November 11-13.

Wherever Concrete Meets Concrete



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EXPANSION JOINT FILLER

Does the job best!

Part of Cleveland's "New Look," the new Municipal Parking Lot, built by American Construction Company, has 2100 car capacity.

"This job is built to take continuous traffic, plus Cleveland's extremes of hot and cold lakefront weather," says American's Ernest M. Green.

"We used Flexcell exclusively in the concrete work. We like the way it stands up under tough everyday punishment, the way it handles and installs. One of the finest products on the market!"

Flexcell fiber board bonds firmly to concrete, compresses without extruding, re-expands to keep joints filled. Uniform asphalt impregnation. Tough, rigid, light in weight. Easy to cut and install. Fabricated to your specifications. Call your Celotex distributor now.

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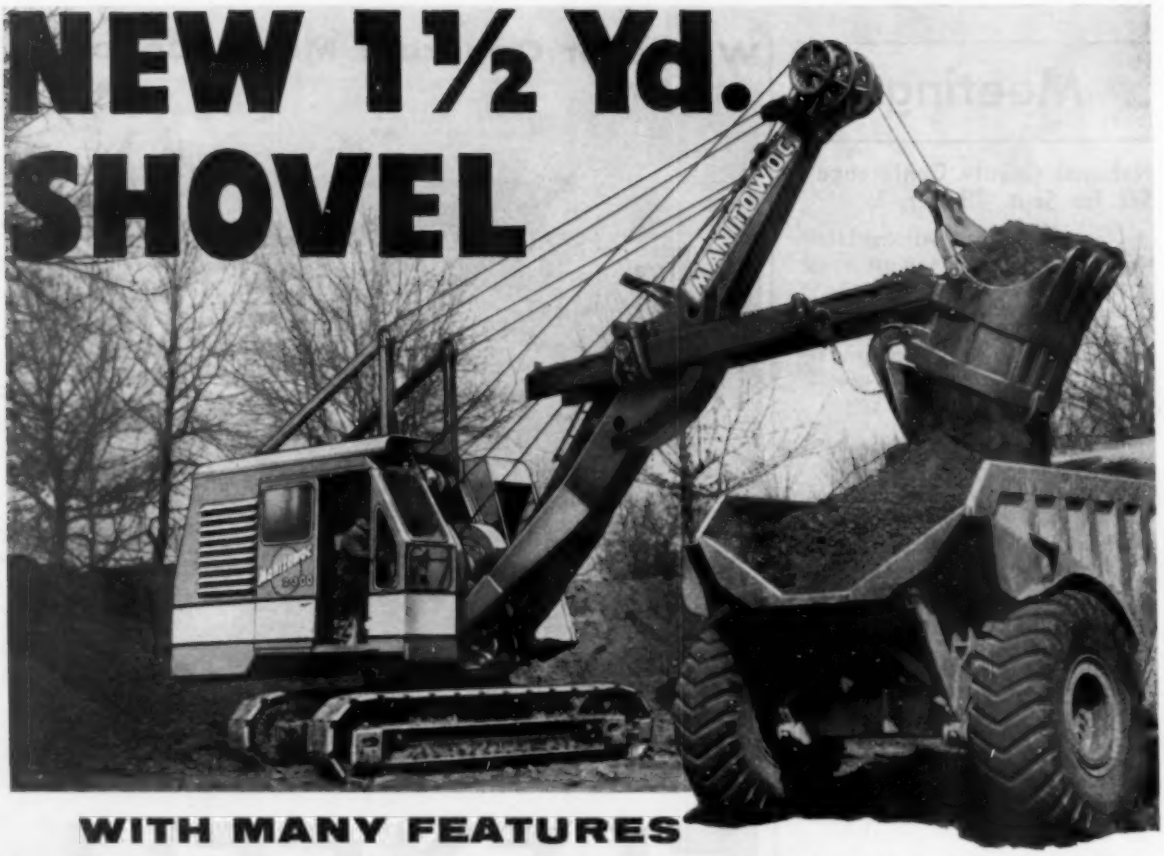

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- ★ Simple, "Power-flo" Slide Pinion Drive . . . Only 11 Gears in Entire Upper Works
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- ★ Simplified Air Controls . . . Smooth Torque Converter
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Move up to the Manitowoc 2300

The new, heavy, rugged Model 2300 delivers a *true* 1½-yd. capacity on any job you can name. You get smooth, powerful, steady performance in dirt or rock . . . as a big capacity shovel, a fast swinging dragline, or heavy-lifting crane.

For economical operation with less downtime; long machine life with high trade-in value; and complete versatility, the new 2300 is the ideal "key" machine for your equipment fleet.

You can make more money on today's jobs only if you have "today's" equipment . . . and the Manitowoc 2300 is as modern as tomorrow. Ask your distributor for literature and full specifications!

35 TON CRANE has a low center of gravity and solid stability. Precise, positive control . . . booms to 130'.

1½-YD TRENCH HOE cuts an 11' level bottom as deep as 32' without machine travel. Air controls and power brakes.

BIG CAPACITY DRAGLINE AND CLAM. Long reach dragline has 1½ - 2½ yd. capacity. Big output clam features fastest closing-hoisting speed.

Manitowoc

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CRANES	SHOVELS	DRAGLINES	TRENCH HOES
20 TON - 100 TON	1-YD. - 5½-YD.	1-YD. - 6-YD.	1-YD. - 2½-YD.

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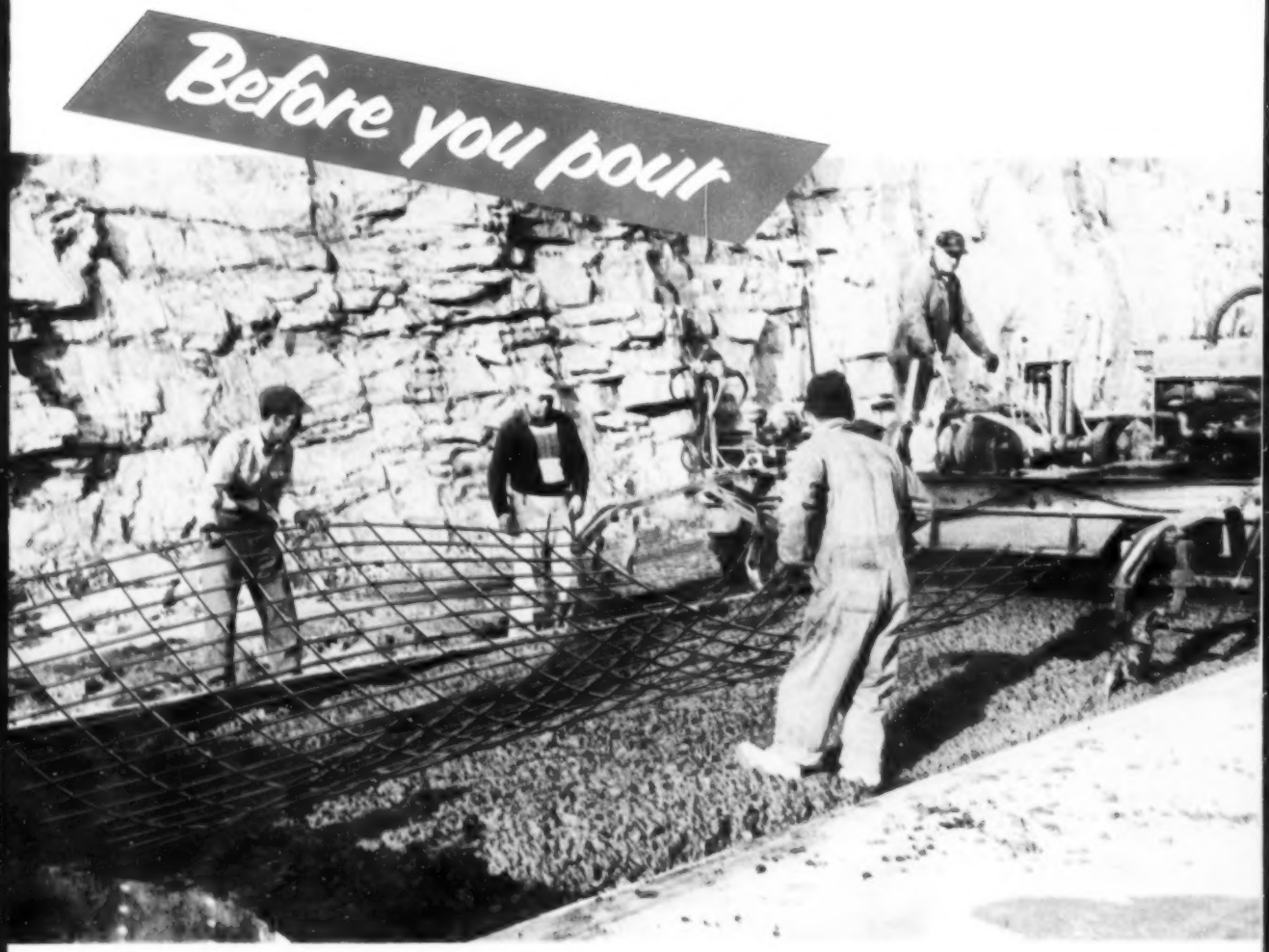

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CLINTON WELDED WIRE FABRIC
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For long-lasting, trouble-free roads, nothing surpasses reinforced concrete. Reinforcement cushions the impact of heavy, fast-moving vehicles . . . holds cracking to a minimum by distributing load stresses over a wide area . . . helps concrete resist contraction and expansion caused by sudden temperature changes . . . and cracks that do appear are held tightly in check, preserving a smooth, solid road surface.

And Clinton Welded Wire Fabric is ideal for highway reinforcement. It is easy to install—it's economical—and its light weight means you also save on transportation costs. Clinton Welded Wire Fabric is available for fast, nationwide delivery, in gages, lengths and widths to meet every specification. For further information and quick order action, call your nearest CF&I Sales Office.

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SAY YES...WITH **CLINTON WELDED WIRE FABRIC**

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Before you order

specify CLINTON WELDED WIRE FABRIC for...

maintenance-free concrete pipe

Maintenance-free pressure mains, highway culverts, sewer mains and drainage ditches are assured when you install reinforced concrete pipe. Reinforcement adds the strength of steel to concrete pipe . . . enables it to resist external loads and withstand internal pressure . . . holds cracking to a minimum.

Should a crack develop, the reinforcement holds it tightly closed, preventing dangerous and expensive leaks. Thus, it helps retain a smooth inner surface that offers minimum resistance to water flow.

Make sure the concrete pipe you install is reinforced. The use of welded wire fabric is more economical than other types of reinforcement, and assures a lifetime of maintenance-free service for concrete pipe. Top-quality Clinton Welded Wire Fabric is readily available in all popular gages, lengths and widths, in both the East and West. For further information, call your nearest CF&I Sales Office listed below.

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The all-new WIDE BASE

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You'll find less time chalked up to down-time once you've equipped your units with the new wide-base General LCM. Built sturdier and huskier with exclusive Nygen Cord and designed to give you consistent crawler-like traction and flotation, The General LCM rolls over the toughest job hazards to get every job done faster for more profit. See for yourself the biggest money-saver in the off-the-road field today... the all new wide-base General LCM.

- built with exclusive NYGEN cord for matchless strength
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- minimum rolling resistance in all kinds of going
- precision engineered to reduce operating costs

Specify GENERALS *on your new equipment*

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They know Whites are rugged!

Cleveland Builders Supply has been using Whites in its fleet since 1913, according to W. T. Rossiter, Chairman of the Board. Newest Whites are a fleet of 14 Model 9064 construction mixers with front power take-off. CBS has Whites in all phases of their operations —mixers, dumps, block trucks and others.

HAS THE ONLY TRULY MODERN LINE CONSTRUCTION TRUCKS

White Ruggedness and Durability are Engineered for bigger Payloads in the Construction Industry... Unmatched for Earning Power

Ordinary trucks won't do for today's loads and schedules.

Trucks have to be rugged and tough.

And these White Construction Tandems really are built to absorb the shocks, carry bigger payloads and keep right on coming back for more.

Every White feature is engineered for your exact work needs—for cost-saving performance and top earning power.

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THE WHITE MOTOR COMPANY
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...GREATEST NAME IN TRUCKS

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power supply · speaker · microphone

MOTOROLA T-POWER 2-WAY RADIO

Improved Performance with Lower Operating Cost

Already famous for the lowest maintenance and operating costs in the mobile 2-way radio field, Motorola radio is an even better investment now—with T-POWER. The vibrator is gone! . . . replaced by rugged, long life transistors. Reduced "down-time", lower maintenance, and greatly improved performance *all* result from this new development. The transistorized POWER VOICE Speaker is 10 times more powerful than conventional speakers . . . talks *through* noise and can be heard hundreds of feet away from the vehicle. The transistorized Dynamic Microphone gives unprecedented voice clarity and greater communications range.

New Mounting Flexibility with Plug-In Control Head . . . Same Basic Unit can be Used for Front or Trunk Mounting

With the T-POWER radio you are no longer restricted to one type of mounting. Install the complete radio, with drawer unit and plug-in control head, for under-dash mounting. For rear mounting, the same basic drawer unit can be installed in the trunk and connected by cable to a dash-mounted control head. And—the same basic drawer unit can be interchanged with the equivalent Motorola Twin-V trunk mount models operated from a 12-volt negative ground source.

Get all the facts. Write now for literature with complete information.

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Transistorized Power Supply for receiver and 25-watt transmitter.

MOTOROLA Communications & Electronics, Inc. · 4501 Augusta Blvd., Chicago 51, Illinois · A Subsidiary of Motorola, Inc.

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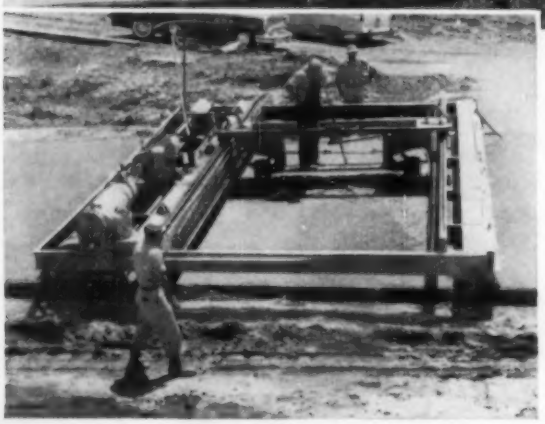
TRANSVERSE FINISHER

with KOEHRING PAVING "PACKAGE"

New Koehring Transverse Finisher produces a mechanically-accurate slab surface that meets the most rigid highway and airport specifications. Precision controls assure uniform crown transitions, maintain proper thickness of concrete at all times.



LONGITUDINAL FINISHER

For "timely" precision finishing also use this Koehring Longitudinal Finisher. It handles all consistencies of concrete — harsh, wet or dry — overcomes slump difficulties on grades and elevated curves — provides final and accurate finish to meet engineering specifications.

twinbatch® PAVER

By saving seconds in every operation big Koehring 34-E *twinbatch*® paver delivers more batches per hour, more concrete per shift, at lower cost and greater profit. Based on 60 sec. mixing cycle, it hits a top output of 86.7 batches per hr. Also check the mobility of Koehring rubber-tired 16-E *twinbatch* paver.

Meet the latest addition to the big Koehring line of paving equipment — the Transverse Finisher. One-man operated, this fast working unit provides efficient, low-cost finishing for all paving jobs. Here's a quick "preview" of its outstanding features.

- *2 oscillating screeds — both screeds adjustable to finish all types of concrete — rear-screed follows rear-wheels.*
- *Hydraulic screed control — just a flick of a lever, raises or lowers screeds instantly.*
- *Single lever adjustment for crown transitions.*
- *Adjustable frame that extends, or retracts hydraulically.*
- *3 traction speeds for finishing — additional high speed for travelling.*
- *3 screed oscillation speeds — with variable length of screed stroke.*
- *Rubber-tired transport wheels that lower and raise hydraulically.*
- *Want more facts? See your Koehring distributor, or send coupon.*

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KOEHRING HEAVY DUTY

REVOLUTIONIZES *digging...loading*

1. 2-yard loader... full revolving, free-swinging for faster cycles.
2. "Stand-still" loading eliminates high maintenance costs of front-end loaders.
3. Cuts fuel and servicing cost by moving up to 400 tons per hour with *only* 70 horsepower.
4. 7′ level clean-up plus more utility because SKOOPER cuts any angle of bank slope.
5. Versatile . . . convertible to use with any excavator attachment.
6. Dozens more startling and revolutionary SKOOPER advantages.

Call your Koehring distributor now to find out more and to make an appointment to see SKOOPER at work.

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K851

SKOOPER'S wide bucket can cut evenly up a sloping bank as well as on an accurate level grade. Crawlers can head into digging or parallel bank.

SKOOPER can load to 9′-11″ over side or end of truck, make 90° dig-swing-dump-and-return cycle without travel, cuts number of trucks needed.

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$14,000,000 sewer project —
Working on a section of a 14 million dollar metropolitan sanitary sewer, Koehring® 605 dragline (left) scoops a wide ditch out of loose, shifting sand. It was teamed up with another Koehring 605 (a 36-ton crane), which set concrete pipe into place. Notice size of giant sewer line in foreground.

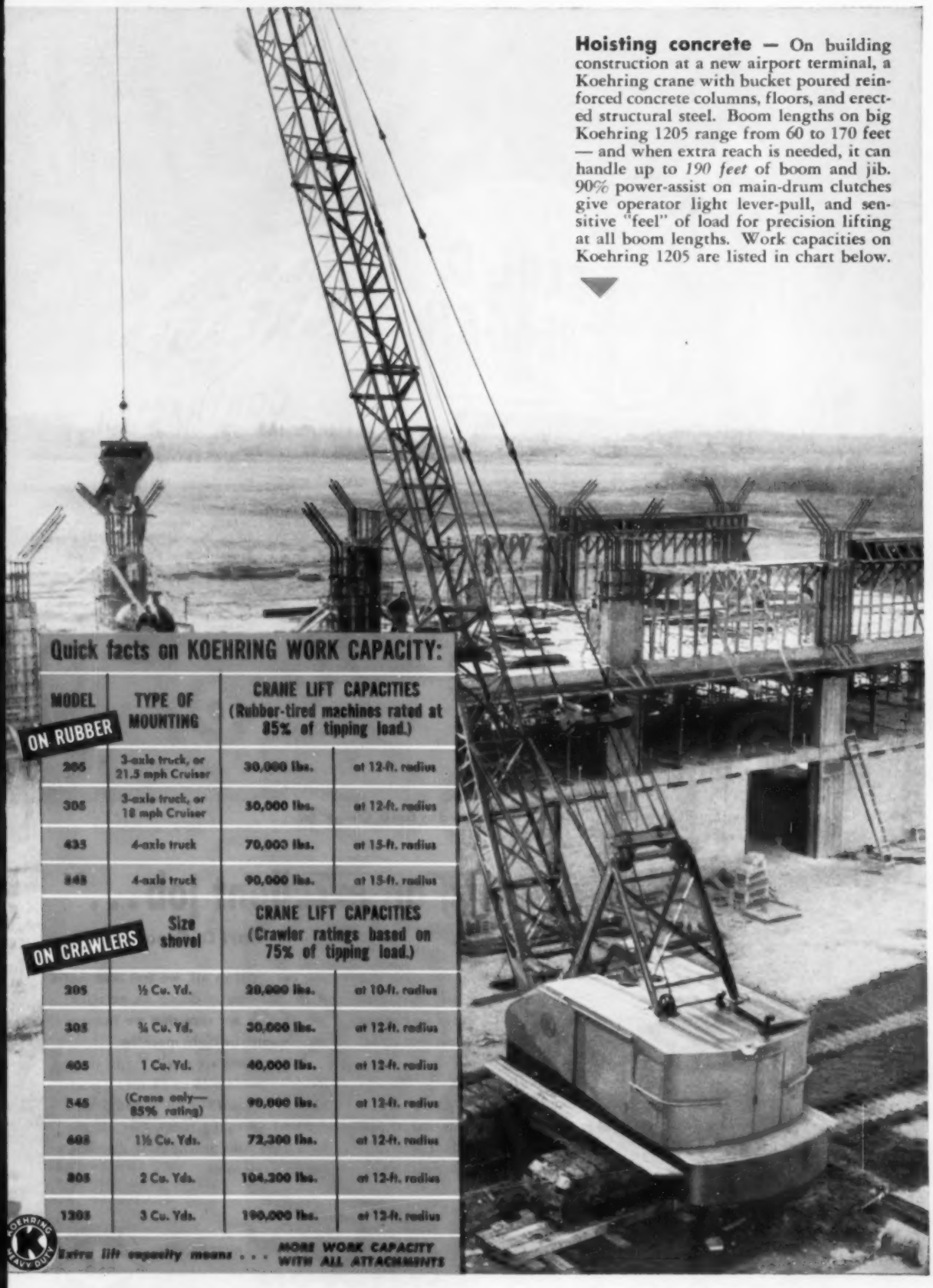
Fills a production gap —
Here is a special size machine in the Koehring line that fills an important production gap on many jobs — big, heavy-duty 805. Capacities: 2-yard shovel — 2 to 3-yard clamshell or dragline with 50 to 150-foot boom — 52-ton crane (based on 75% rating).

Introducing . . . the new 435
Latest addition to the big Koehring line on rubber, this new 435 truck crane safely lifts up to 35 tons (with 40-foot boom at *15-foot* radius). That's based on conservative 85% rating. It quickly converts from fully equipped machine to roadable machine — removable counterweight, boom, outriggers reduce weight for highway travel.

Check the chart — pick the size and type that best fits your needs — then phone Koehring distributor for a demonstration.

KB31

KOEHRING DIVISION OF KOEHRING COMPANY, Milwaukee 16, Wisconsin
Koehring excavators and cranes also manufactured in CANADA • ENGLAND • SPAIN • JAPAN



Hoisting concrete — On building construction at a new airport terminal, a Koehring crane with bucket poured reinforced concrete columns, floors, and erected structural steel. Boom lengths on big Koehring 1205 range from 60 to 170 feet — and when extra reach is needed, it can handle up to *190 feet* of boom and jib. 90% power-assist on main-drum clutches give operator light lever-pull, and sensitive "feel" of load for precision lifting at all boom lengths. Work capacities on Koehring 1205 are listed in chart below.

Quick facts on KOEHRING WORK CAPACITY:

MODEL	TYPE OF MOUNTING	CRANE LIFT CAPACITIES (Rubber-tired machines rated at 85% of tipping load.)	
ON RUBBER			
205	3-axle truck, or 21.3 mph Cruiser	30,000 lbs.	at 12-ft. radius
305	3-axle truck, or 18 mph Cruiser	30,000 lbs.	at 12-ft. radius
435	4-axle truck	70,000 lbs.	at 15-ft. radius
845	4-axle truck	90,000 lbs.	at 15-ft. radius
ON CRAWLERS	Size shovel	CRANE LIFT CAPACITIES (Crawler ratings based on 75% of tipping load.)	
205	½ Cu. Yd.	30,000 lbs.	at 10-ft. radius
305	¾ Cu. Yd.	30,000 lbs.	at 12-ft. radius
405	1 Cu. Yd.	40,000 lbs.	at 12-ft. radius
845	(Crane only—85% rating)	90,000 lbs.	at 12-ft. radius
605	1½ Cu. Yds.	72,300 lbs.	at 12-ft. radius
805	2 Cu. Yds.	104,300 lbs.	at 12-ft. radius
1205	3 Cu. Yds.	190,000 lbs.	at 12-ft. radius

Extra lift capacity means . . . **MORE WORK CAPACITY WITH ALL ATTACHMENTS**

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A-W Tandem Roller compacting base for asphalt road at Dayton, Ohio. Owned by Earl D. Creager, Inc.

"Our A-W Tandem is doing an excellent job..."

—Earl D. Creager, Inc.

Earl D. Creager, Inc., is a general contracting firm in Dayton, Ohio, which does a considerable amount of road and highway construction work. The company owns about $1,000,000 worth of equipment, in 1956 grossed more than $3,000,000. In May 1957 it purchased a new A-W Tandem Roller.

Earl D. Creager, president, says: "We made our decision to buy an Austin-Western after looking the market over very carefully. Precision and dependability were our main concerns, and the A-W seemed to fill the bill best.

"Our operators tell us that the machine gives exceptionally smooth and steady performance. Also that its full visibility, convenient dual controls, and hydraulic steer make finish grading easy. All in all, we feel that our A-W Tandem is doing an excellent job and we are sure that we put our money into the right machine."

A-W rollers are available in these models: tandem (5 to 14 tons), portable tandem (3½ to 6 tons) and 3-wheel (8 to 14 tons). Get all the facts from your nearby A-W distributor or write to us.

. . . for more details circle 237 on enclosed return postal card

Austin-Western CONSTRUCTION EQUIPMENT DIVISION, AURORA, ILL.

BALDWIN · LIMA · HAMILTON

Power graders • Motor sweepers • Road rollers • Hydraulic cranes

Rock, Muck, Dirt—

Scrapers and Dozers Moved it All

Tennessee contractor used unorthodox methods in handling 950,000 cubic yards of unclassified excavation for U.S. 27 relocation.

WHAT mucking method would you use to undercut to a depth of 5 to 10 ft. over the full roadway width, for a distance of 300 ft. or so, in removing shallow pockets of unsuitable material?

If the conditions were very soupy, you'd probably use a dragline. If only just plain wet, you might send in your scrapers, have plenty of push tractor capacity and snatch cables on hand, and hope for good results.

On this Tennessee road relocation job, McDowell & McDowell, contractors, veteran Nashville firm of earthmovers ("We Move the Earth," their slogan), used neither of these procedures. Instead, they towed a Gar-Wood 28-yd. scraper through with a Cat D8 and a D9 in front on a cable. This tandem pulling team, circling in and out of a 100 by 300 ft. pit of 10 ft. maximum depth below ground surface, moved 1,700 cu. yd. in a 10-hour working day and completed the undercutting of 6,500 cu. yd. of muck in four days.

The same plan of action was used on other locations. In each instance, the spoil was dropped on the right-of-way immediately adjacent, where good and poor material were intermixed and laid out by a D7 dozer after brief drying.

The contractor in using this method realized that around $100,000 in equipment was tied up in the tandem scraper pulling. But 1,500 to 1,700

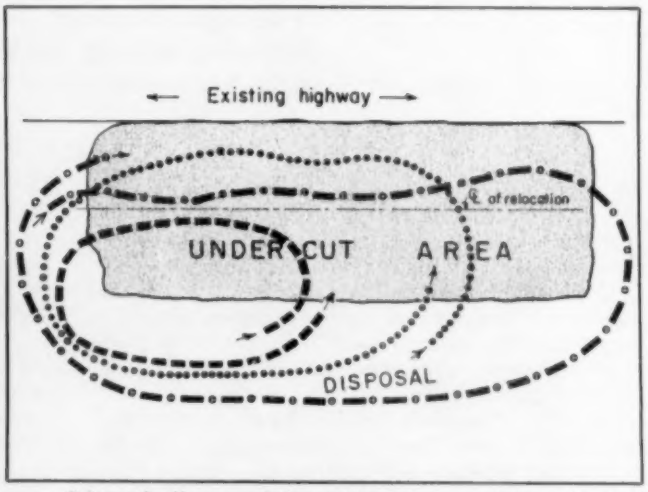
Dozing Shot Rock

Blasted sandstone in this shallow through-cut is being dozed longitudinally into the adjacent fill area. A Caterpillar D9 handled this job, which involved ripping out many large partly displaced fragments and intermixing big rock with finer material for good keying and consolidation.

1 Entering pit for load—a Gar-Wood 28-yd. scraper drawn by Cat D8 with Cat D9 "lead horse" out in front on a cable.

2 Turn being completed with full load in relatively stiff, wet clay. The two tractors were able usually to handle heaped load, but reduced loads were sometimes found expedient.

3 The pan is filled. Operators decide to turn, take load back through dry side of pit, and circle for disposal alongside. Note sharp turn, which involved some lateral sliding of the second tractor.



4 Schematic diagram of the circling passes made in and out of the pit area, as material was undercut, hauled out and spread on right-of-way ground alongside. The lead tractor operator set the path, on advice of foreman.

STEP-BY-STEP: HOW TENNESSEE CONTRACTOR

cu. yd. per day was considered to be very good production under the circumstances, probably exceeding the output of a small dragline which would have required a long trailer haul-in.

Making for success with the scraper method, was the fact that the muck bottomed out at a relatively shallow depth, and that the stiff brown and blue clay intermixed with the organic muck offered considerable stability, although requiring heavy push-loading effort at times.

The accompanying photographs show an undercutting in progress over the full width of the shallow cut section. The undercutting extended about 300 ft. along the road line, and to 10 ft. maximum and 6 ft. average depth. Pockets of very wet material were mucked out as quickly as possible, and kept confined by careful manipulation of the equipment, so that water would not spread and add to the slippery condition.

For this work the tow line between the leading D9 and the D8 consisted of two 1½-in. cables. Salvage cable purchased from a nearby coal mine was used for this job, with cable breakage and replacement occurring every day or so. Cable length between tractors was varied experimentally. A length of about 15 ft. was found best for the sharp maneuvers and steep rises out of the holes.

A second Gar-Wood scraper was on hand, and where the conditions were easier the two pans were worked using a single towing tractor and pusher service for each. Mucking was completed in late summer following a prolonged wet period.

● *Seven-Mile Job.* Actually mucking was only a minor part of this job, which entailed 950,000 cu. yd. of unclassified excavation, running 20 to 30 percent rock. The yardage

5 General view of 300 ft. long by 100 ft. wide pit, looking along the highway axis during undercutting. Most wet pockets have been cleaned out. Scraper being drawn across a steep slope, with some side slipping, to reach a pocket of material lying just beyond.

6 On return leg, load was spread on ground surface adjacent to the undercut area, where a small dozer laid the muck out and mixed the material while it dried.

7 Here is the equipment making a pass in the opposite direction. Direction of circling was varied according to conditions, with the objective of getting a load on the way out of wet ground, when possible.

MADE QUICK WORK OF MUCK UNDERCUTTING

was scattered along many shallow cuts and fills, some cuts however being as large as 350,000 cu. yd. The contract covers grading, drainage, structures and paving for a relocation which will straighten a winding, hilly segment of 2-lane U.S. 27. The grading is being completed in 1958.

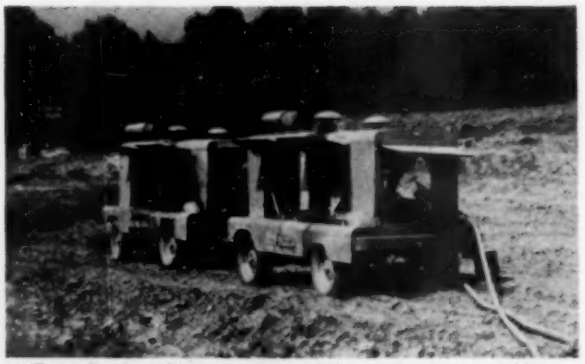
In addition to the two Gar-Wood pans, the contractor has used Euclid S-18 (2-axle) and 22 TDT (3-axle) scrapers. Push loading in the sandy-clay and hardpan was done with D8s and D9s, the latter with hydraulic rear-mounted rippers. Earth is rolled with a sheepsfoot unit and Case diesel 520 tractor, and a Hyster Grid Roller drawn by a D7.

● *Rock Moved with Dozers.* Another feature of the job has been the complete reliance on bulldozers instead of shovels and wagons for moving blasted rock out of cuts. This was feasible because of the

This Earthmover Believes in Tooting Own Horn

The earthmoving firm of McDowell & McDowell, Contractors, of Nashville, Tennessee, one of whose jobs is here described, has published an attractive pictorial booklet describing its accomplishments and facilities. The booklet has proved useful in soliciting work from subdividers, industrial firms and others. The contractors have an affiliate company which specializes in asphalt construction and another which does complete home construction.

● A pair of Joy blast-hole drills (TM-450 and TM-500), the larger one tractor-mounted, worked either separately or as a pair, each with its own 600 cfm compressor.



● Two Gardner-Denver rotary 600 compressors working in linked-together position, ready for moving in tandem to the next work site.

● "Give us more days without rain," was the familiar comment of McDowell & McDowell's crewmen. The 600,000 cu. yd. of scraper yardage was moved chiefly with Euclid 2 and 3 axle scrapers.

● Compaction of silty clay was accomplished under Tennessee's "results" specification. The contractor is seen using a Hyster grid roller with Cat D7 in conjunction with a small sheepsfoot drawn by a Case 400 diesel tractor for finishing out each layer.

softness of the sandstone and the relatively short length of most cut sections. Scrapers also help move rocky materials at times for this work, which is still in progress. Blasted material containing boulders up to permissible maximum size is being placed in 3 ft. lifts.

Blast hole drilling is done by a Joy TM-450 crawler-mounted drill (3 to 3½ in. bits) and a Joy TM-500 drill mounted on a Cat D6 tractor (4 in. bits). Two Gardner-Denver 600 rotary compressors supply the drills. This contractor has used Brunner and Lay tungsten carbide tipped X-type bits, fastened to Joy 1½" x 10' drill steel. (The foreman credited the TM-450's design and operating characteristics to the fact that drill steel breakage has occurred only three times in 2,200 hours of operation by this drill on this job and one preceding.)

Blasting is done with ammonium nitrate fertilizer where open conditions favor using this type of explosive. The fertilizer with 5 percent fuel oil impregnation is spilled in the hole from 50-lb. shipping bags, and detonated using a dynamite cartridge and Primacord. For more careful shooting, which usually is required due to nearness of homes or the existing roadway, shooting is done with DuPont Red Cross 60 percent Extra.

● *Acknowledgements.* J. W. McLaughlin is project manager for the U.S. 27 relocation project of McDowell & McDowell. Thomas L. Copas is resident engineer for the Tennessee department of highways, under J. B. Ramsey, division engineer at Knoxville. W. M. Leech is commissioner of highways.

● Florida State Road Dept. has issued an 83-page booklet outlining operating policies for its 5,931 employees benefit, recommended by a management survey.

CONTRACTORS VS. ELECTION CAMPAIGN FUNDS

When a highway contractor, as a businessman, makes a campaign contribution, when is it acceptable and in the public interest? Political party work requires funds, and someone has to pay for election or re-election campaigns.

The other side is that motorists do not pay gas taxes to finance political campaigns. Nor do they send their tax money to Washington, to be returned in the form of 50 or 90 percent federal highway aid to the states, so that part of the money can go for spoils politics. Yet tax money pays for such shenanigans. When there is a widespread shakedown on road contractors, as reportedly occurred recently in Ohio for Governor O'Neill's re-election campaign, you can be sure that the contractors will imbed their contribution in their bids. The road fund thus suffers a very real form of diversion.

● "I don't think it is any of your business who I solicit or how much I am getting," Paul Miller of Ohio highway department division 9 at Chillicothe is quoted as saying, when asked about solicitations for the Governors' Day celebration.

When highway contractors, living off of public funds are given the squeeze for substantial sums, it certainly is the business of every citizen. It is likewise the citizen's concern when highway department rank and file personnel are also asked to kick in on election campaigns. The Cleveland Press in its recent front-page publicity over these matters is performing the kind of vigilant public service much needed today as the highway program's millions are being spent on an expanding scale.

A MODERN HIGHWAY TO ALASKA

Now that Alaska is coming into the Union, one of the first things needed, notes the *Chicago American* on its editorial page, will be a really good highway for cars and trucks to roll between the new state and the old ones.

This will be an ambitious undertaking, and one that will require cooperation with our Canadian friends. It is also a project which will require a great deal of imaginative thinking, looking toward the tremendous growth in the value of the project far beyond any immediate traffic patronage. Its defense value will of course also need careful evaluation.

The Alcan, which was built in haste in 1942 and 1943 as a supply line to Alaska for military purposes, is principally still a gravel road and far from a modern one in its geometrics. The road carries a trickle of traffic, as the hardy or venturesome motorist tackles the long winding mileage.

What is needed is an entirely new look at the highway need, in the light of the 15 years that have elapsed since the original construction. No serious expenditures are warranted here unless the new construction is designed to carry high-speed vehicles including heavy trucks. The answer means a complete relocation of the present road in many spots; reconstruction generally including a hard surface.

The road can be built today with the knowledge gained in the wartime construction—including the discovery that permafrost and other north country conditions need hold no terrors if the problems are tackled with known techniques—and, if the relatively high costs are justified.

UPS AND DOWNS HIT THE CONTRACTOR

We have often spoken on this page of the importance of planning state highway programs so that there will be a uniform flow of jobs into the hands of contractors from year to year, rather than feast or famine.

A example of such a fluctuation that, while a minor one percentagewise was nonetheless felt, is that of the asphalt road programs in Minnesota. As noted in a review in this issue, the annual production of plant mixes has ranged from 800,000 to 1,250,000 tons, in a curve that seesawed to a peak in 1956 and then dropped off by 15 or 20 percent in 1957.

The difficulties faced by highway administrators in preventing such fluctuations are many. In most states money has not been available in uniform yearly amounts. Phase progress in long-range programs does not assure necessarily that a uniform amount of work of any one kind will be up for letting from year to year in handling projects on a priority basis. New specifications and design policies in our changing technology likewise affect the flow of contract jobs.

The fact remains that in many states today the contractors are continuing to suffer from the familiar disease known as "fluctuation." Where this disease is present, even mildly, the public usually gets less for its highway dollar.

Low Cost Roads and Hardstands

Lime Stabilization Methods and Experience at Fort Polk, Louisiana

Details of design and construction for a program based on successful local experience with lime as an economical stabilizing material.

By Charles G. Van Dine, C.E. Chief, Roads and Grounds Divisions, Fort Polk

LIME STABILIZATION is the basis for a motor pool improvement program at Fort Polk, involving 140,000 sq. yd. of hard stands for tanks and heavy wheeled vehicles. The methods are based on 7 years' experience with hydrated lime.

Formerly the only paved sections of the motor pool areas were the center concrete invert strips, serving as combination drives and drains. In wet weather the unpaved clay-gravel areas were incapable of carrying the heavy traffic loads; and in dry weather, dusting was a problem. By incorporating 3% lime (by weight) into the existing highly plastic gravel base material and applying asphalt surfacing, the parking areas are transformed into hard, durable roadways, capable of withstanding 45-ton tanks and heavy wheeled vehicles, in all kinds of weather. Cost of the lime stabilization on the present job is relatively low, amounting to 50¢ per sq. yd.

Lime stabilization was first used at Fort Polk in 1951, as part of an over-all road improvement program of the Fourth Army Command, at its posts in Texas, Louisiana, Arkansas, Oklahoma, and New Mexico.* Prior to 1951 the surfaced roads at Fort Polk, incorporating plastic gravel bases similar to those in the motor pool areas, were subject to potholing, ravelling, and edge failure. Maintenance costs were excessive. By switching to lime stabilization, the post organization reduced maintenance drastically, at the same time building some of the finest Army roads in the U.S. Since 1951, more than 30 miles of roads and streets and 200,000 sq. yd. of parking and motor pool areas have been stabilized with lime.

● *Early Jobs.* A summary of the various projects to date is shown in Table I. The biggest project, in 1952, involved the construction of about 25 miles of main roads and post streets, using 3,750 tons of lime, to stabilize in-place material. Where needed, additional pit-run gravel was added before stabilization. Depth of stabilization on the heavy duty roads was 8 in., on the post streets, 6 in. These roads, which were surfaced with double asphaltic treatment, are still in excellent shape, in spite of carrying heavy truck traffic regularly and tank traffic occasionally. Due partly to the large size of the project, stabilization costs were the lowest of all Fort Polk projects—average of 33¢ per sq. yd. (includes lime and manipulation).

The other projects, involving additional roadways and several parking areas, were similar in design and construction. Generally, 3-4% lime was used, and stabilization depth was 6 or 8 in., depending upon the traffic loads. Costs ranged up to 50¢ per sq. yd. Work was performed by both the post maintenance forces and on contract. One exception was the airfield, which was built by Army troops in 1955. Measuring 100 x 3,000 ft. in size, the airstrip incorporates a 9-in. lime-stabilized gravel base and a 3-in. wearing surface of non-plastic sand mixed with emulsified asphalt. Paralleling it is a 100 x 1000 ft. stabilized parking strip, both designed for light aircraft.

Evidence of lime's stabilizing action at Fort Polk is seen in Table II, which gives soil constants both before and after stabilization of two typical soils. These particular tests were made during the 1952 road building project by the Headquarters 4th Army Engineering Materials Laboratory. The soils were yellow clay gravels having an average screen analysis of 5-8% retained on ¾ in.; 20-30% retained on No. 4; and 40-60% retained on No. 40.

Note that after lime treatment the P.I., lineal shrinkage, shrink-

● **Lime stabilized hard stands withstand 45-ton tank traffic. Double surface treatment applied.**

* See article "Stabilizing Weak and Defective Bases with Hydrated Lime," by Maynard G. Fuller and Gordon W. Dabney, Roads and Streets, March, 1952.

● **Parking strip for light planes, lime stabilized by troops in 1955. 3% lime used.**

● **Bulk spreading of hydrated lime at Fort Polk in building parking areas for 45-ton tanks.**

● **Seaman mixer performs mixing operation, using 2 or 3 passes.**

age ratio, and soil binder content dropped sharply. These changes, which occur immediately after lime is added, are explained by a base exchange mechanism, wherein the clay particles are agglomerated into coarser silt and even sand sizes. California Bearing Ratio tests made during construction also indicated a substantial gain in shear strength. Raw C.B.R. values averaged about 50; but after lime treatment they doubled, and some even went as high as 225.

Evidence of long-term strength gain is seen in the accompanying photo of the writer and G. M. Cavanaugh, maintenance superintendent, examining a sample of stabilized gravel chiseled out of one of the 1952 roads. The cementing action is believed to be pozzolanic in nature, with the calcium from the lime combining with the aluminum and silica in the clay fraction, thus forming calcium-alumino silicates.

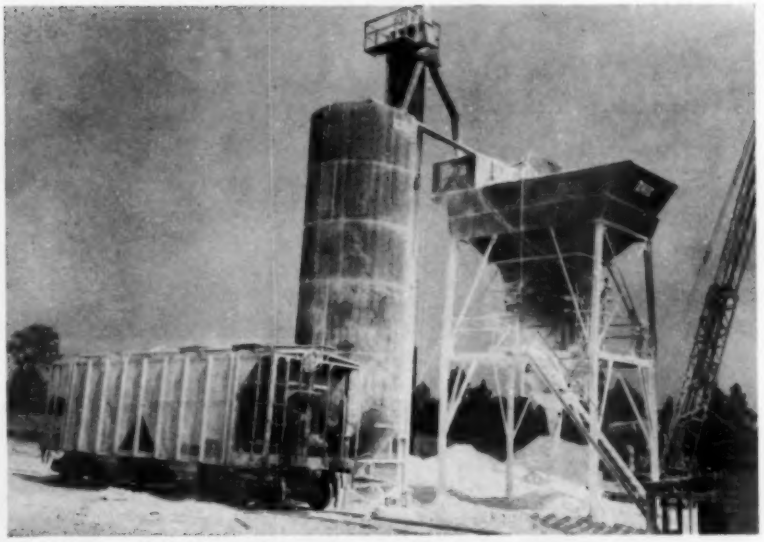
● *Present Motor Pool Job.* The current 140,000 sq. yd. stabilization job involves ten blocks in the motor pool area of South Polk. The design is based on the C.B.R. of the inplace profile, for 9,000-lb. wheel loads. Because the subsoil varies throughout the area, three cross-sections are used (Fig. 1). Each comprises subgrade, subbase, and base layers, with total thickness being either 17 or 20 in. In all sections the base must have a minimum C.B.R. of 60, the subbase, 35; and the subgrade, 6 or 9.

In sections A and B only the base requires lime stabilization, since underlying materials have adequate bearing value to meet design specifications. Depth of stabilization in these sections is either 5 or 6 in. In section C, however, the entire 17 in. thickness of in-place material requires stabilization; the subgrade, in particular, has a very low bearing value, consisting mainly of gumbo clay. In this section, stabilization is done in three lifts, whereas with sections A and B, the base is stabilized in one lift. In all stabilized layers, 3% hydrated lime (by weight) is used.

● *Construction Methods.* The construction procedure is simple, involving scarifying, spreading lime, mixing, and compacting. Where needed, small amounts of gravel obtained from a nearby pit are spread to bring parking area to grade. Specifications for the new base material call for 100% passing 2 in., 65-100% passing ¾ in., 35-75% passing No. 4 and 15-35% passing No. 40; and maximum values for liquid limit, P.I., and lineal shrinkage are 40, 12, and 7% respectively. The existing base material must also meet these same requirements, which is possible through the addition of 3% lime, as indicated in Table II.

The only specifications for the subbase and subgrade materials pertain to C.B.R. values discussed earlier. In areas underlain by excessive amounts of gumbo clay, it is necessary to excavate and remove some of this material. The remainder is then stabilized to meet the

● Grader-scarifier loosening up clay gravel before lime is spread.



● Ready-mix batching plant used for handling and batching lime to trucks.

minimum C.B.R. requirement of 9.

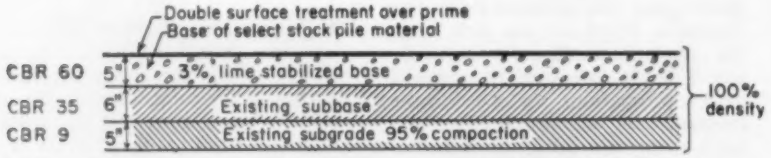
In areas requiring full 17 in. of stabilization, the first step is to remove the top 11 in. of gravelly material and stockpile it in windrows along the construction lane; this operation is handled by a P & H ¾ cu. yd. truck-mounted dragline and a Caterpillar No. 12 grader. Then the bottom 6 in. of material is scarified with a scarifier attachment. Next bulk lime is applied from a Flynn conveyor-belt type spreader attached to the rear of a Ford F-600 dump truck; two passes are needed for 3 per cent distribution. The contractor operates four 2½-ton dump trucks, with built-up side boards; each hauls 5600 lb. of lime.

● After spreading, the lime-soil mixture is blended uniformly with a Seaman Pulvimixer, which makes two or three passes. When necessary, water is added before the final pass to facilitate pulverization. It is required that all clay clods be broken down to pass a No. 4 sieve, exclusive of gravel. After mixing is completed, the subgrade course is brought to optimum moisture content and rolled to meet 95% density. Because the subsoil is generally wet, little or no water is needed in compacting the subgrade. A fast, unique method of rolling is used, consisting of two 48-in. sheepsfoot rollers and a Bros 10-ton rubber-tired roller, pulled in tandem by a Ford diesel tractor. About six passes are needed for necessary compaction.

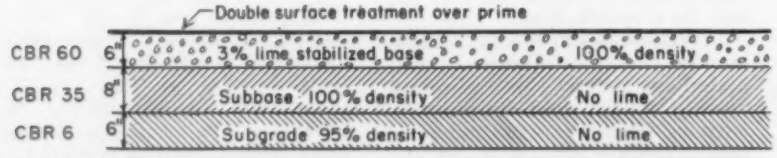
Immediately after the subgrade is compacted, enough material is brought back by the grader from the windrows for the 5 in. subbase lift. This is stabilized in a similar manner to the subgrade. Finally the remaining material is brought back for stabilization of the 6 in. base course. Generally, more sprinkling is required with the base and subbase layers, since the material is more granular and drier than the subgrade soil. Unlike the subgrade, specifications for the two upper layers called for 100% compaction, which is obtained readily.

After the base is shaped, it is maintained in a moist condition for a minimum of four days, during which period vehicles heavier than rubber-tired rollers are kept off. Following this curing period, the finished base is allowed to dry for three days. Then a P-1 prime coat is applied, at the rate of .25-.30 gal. per sq. yd. After two days, the parking area is surfaced with a double asphaltic treatment, using asphalt cement.

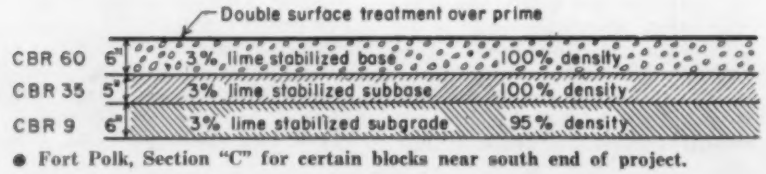
(Continued on page 58)



● Fort Polk pavement section "A". For areas inside original perimeter concrete drives in designated blocks.



● Fort Polk pavement section "B", areas outside original perimeter concrete drives in designated blocks.

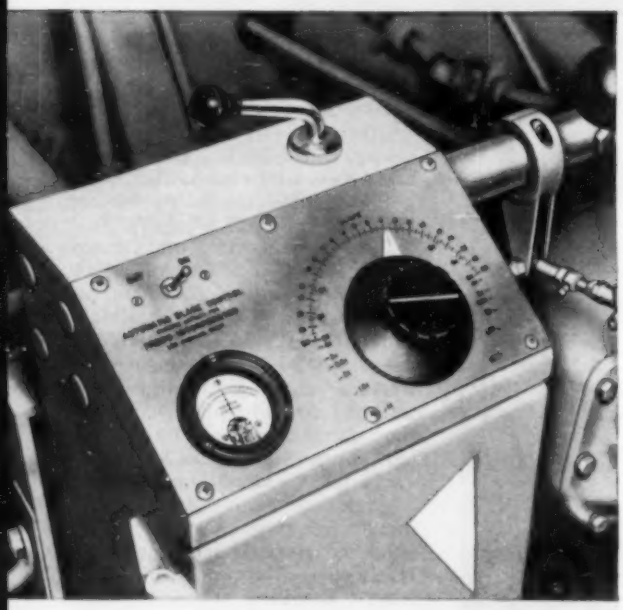


● Fort Polk, Section "C" for certain blocks near south end of project.

JOB REPORT FROM NEVADA ON

AUTOMATIC BLADE CONTROL

–AVAILABLE ONLY FOR CAT MOTOR GRADERS!



JUST DIAL THE SLOPE ON THIS PRECO AUTOMATIC BLADE CONTROL...

...IT CONTROLS BLADE SLOPE WITHIN ⅛" IN 10', REGARDLESS OF TERRAIN!

From job after job, reports are coming in about the performance of the Preco Automatic Blade Control, a major feature introduced last year for exclusive use on Cat Motor Graders. How's it doing? Here's a typical answer from Superintendent Bill Hanson of Isbell Constr. Co., Inc., of Reno: "Work on finish is easier with the automatic control and is very accurate." His remarks are the result of work on a 9-mile, 4-lane freeway project near Carson City, Nevada. As for accuracy, controlling blade slope *within ⅛" in 10'* can be done!

More improvements for the No. 12

Though the No. 12 has earned the reputation of "standard of the industry," Caterpillar constantly looks for and finds ways to improve this machine. Automatic blade control is an example. Here are some other, even more recent improvements:

Longer main frame—a 4¾" longer main frame adds extra clearance between toe of blade and front tire for all blade positions.

Better visibility—31% more glass area in cab increases operator's visibility and efficiency.

Increased operator comfort—new seat adjusts fore and aft. Back rest adjustable, too. Cab 6" higher and cab roof insulated to reduce noise level.

Increased versatility—4" longer tandem provides plenty of clearance for chains even when machine is equipped with large 14.00-24 tires.

Have you seen the improved No. 12?

Because of these and other new features, you can count on the No. 12 for even better work—and faster. Look it over at your Caterpillar Dealer. Better still, look it over in action. Have him demonstrate a No. 12 equipped with automatic blade control. See for yourself how it steps up production!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

FOR HIGH PRODUCTION, EQUIP YOUR CAT MOTOR GRADERS WITH AUTOMATIC BLADE CONTROL

. . . for more details circle 250 on enclosed return postal card

● **Method of compaction, involving sheepsfoot and rubber-tired roller in tandem. Five or 6 passes suffice for 100% compaction. In background P&H dragline used for excavating soil (top lift) which is windrowed on concrete drive on lift.**

● **¾-yd dragline removes top lift of clay gravel for stockpiling. Later it is brought back for 6 in. stabilization.**

LIME STABILIZATION

(Continued from page 56)

Bulk hydrated lime for stabilization is shipped in covered hopper cars from the Cheney Lime and Cement Co. lime plant at Allgood, Ala. To facilitate lime handling, the contractor makes use of a ready-mixed concrete batching plant, which was originally set up on the post to handle concrete work. Facilities include an undertrack screw conveyor, bucket elevator, 750 bbl. storage silo, a 100-bbl. batching bin, and a 5 cu. yd. weigh batcher, which are used interchangeably for concrete and lime jobs.

The present lime stabilization job at Fort Polk is part of a $500,000 motor pool improvement program, which includes considerable concrete work. L. H. Bossier, Inc., Alexandria, La. is the prime contractor. The contract calls for 1,698 tons of lime. The bid price for the lime stabilization work was $67,920, based on a unit figure of $40 per ton (actually this includes cost of lime, mixing, and compacting, but not surface treatment).

Key contracting personnel are L. H. Bossier; Morgan Gill, subcontractor handling the stabilization work; and George Baria, superintendent. Lt. Col. Robt. H. Hayden, C.E., is Post Engineer; Earl L. Eagles, Civilian Deputy Post Engineer; and Chas. G. Van Dine, C.E., Chief, Roads and Grounds Division.

TABLE I

Summary of Lime Stabilization at Fort Polk, Louisiana*

Year	Type of Job	Sq. Yd.	Miles	Thickness	% Lime	Tons Lime	Cost Sq. Yd.
1951	Main Road between No. and So. Polk	33,000	3	9 in.	2% lime	150	50¢
					2% lime, 6% cement		
1952	Main Roads & Streets No. and So. Polk	142,200	12	8 in.	3, 4%	3750	33¢
		145,100	12½	6 in.	3, 4%		
1952	Hospital Parking Area	5,000	—	6 in.	3%	55	36¢
1952	Main Road	20,400	2	6 in.	4%	205	43¢
1955	Airfield**	40,000	—	9 in.	3%	350	—
1956	Cold Storage Plant Parking Area	6,800	—	6 in.	3%	60	—
1957	Ordnance Parking Area	4,500	—	8 in.	3%	55	50¢
1951-58	Misc. Parking Areas, Road Maintenance	20,000	—	6 in.	3%	200	—
1957-58	Hard Stands for Tanks & Wheeled Vehicles	136,000	—	5, 6, 17 in.	3%	1700	50¢
Totals		553,000				6525	

*Note: Post inactivated 1953-54
**Constructed by troops

TABLE II

Soil Constants Before and After Lime Stabilization

Description	Liquid Limit	Plasticity Index	Shrinkage Limit	Lineal Shrinkage	Shrinkage Ratio	Soil Binder
Clay-Gravel	33	20	16	8	1.81	57
3% Lime Added	30	2	26	1	1.39	14
Clay-Gravel	38	23	19	10	1.87	69
3% Lime Added	32	13	21	5	1.71	52
4% Lime Added	32	10	22	4	1.66	42

● (Left): To fit the tractors into the planes they were dismantled into components. Two mechanics are shown preparing one of the TD-9s for the airlift. (Right): Because of the remote unloading and loading sites, primitive methods were used to skid the heavy TD-9 parts up the crude but effective timber ramp and into the plane.

AIRBORNE DOZERS BUILD AIR STRIP IN WILDS

A BULLDOZER had to be flown in to begin lengthening and widening a remote air strip in Idaho. The field is located at Moose Creek Ranger Station, 100 miles east of Lewiston, Idaho.

The station "50 miles from nowhere" is famed for its big game and fishing and is accessible only by air. In 1932 an air strip 2,600 ft. long was fashioned with mules and manpower as an aid to fire protection. The strip surrounded by mountains and tall timbers can only be used in the early morning or early evening hours because of tricky air currents. Last year more than 600 landings and take-offs were made from this strip. With a doubling of this traffic in prospect the Forest Service and the Civil Aeronautics Authority decided on an additional, longer runway for safe operation.

Ten bidders sought this job despite its remote location which the contractors knew would require flying in heavy equipment in the absence of usable trails. The one-season task was not a large one; merely to push over and burn 25 acres of virgin timber, ditch and install drain tile, and move 50,000 cu. yd. of earth.

Henry Vanderwall of Grainsville, Idaho, was the low bidder at $67,102. Immediately, he was faced with the problem of getting in two International TD-9 crawler tractors equipped with dozer blades. The firm contacted a flying freight service which operates Douglas DC-3 cargo-type planes with experience in moving heavy equipment into remote areas. The service agreed to fly in the tractors and fuel and construction materials as well.

The TD-9s were first dismantled into small enough components for handling manually. The units were flown to the site without mishap and reassembled. The two tractors handled the clearing, tilling and grading successively, working as a team.

The new runway, 250 by 41,100 ft., intersects the old 450 by 2,600 ft. strip. Both runways are one-way because of limited approaches.

The airlift handled, in all, over 8,000 gal. of diesel fuel, 1,000 gal. of gasoline, 16,000 lin. ft. of pipe, and 7,000 ft. of wire. The contractor found that air transportation in such cases can be expensive. Normally, he would pay 19¢ for diesel fuel oil and 30¢ a gallon for gasoline in this area. The airlifted prices, 55¢ and 67¢.

● No second guessing when landing on this strip. Completely surrounded by towering mountains and tall timber, this 2,600 ft. runway at Moose Creek Ranger Station, 100 miles east of Lewiston, Idaho was augmented during 1957 by adding another 4,100 ft. runway.

ROAD WORK IS ROLLING

Faith by the state department back in 1954 that the Interstate program would be enacted is paying off today—a record $112.5 million in state highway contracts will be awarded this year (double 1957), and expenditures for all classes of projects have reached a new high.

By Harold J. McKeever, Editor-in-Chief

WHEN a state highway department more than doubles its contract awards in a single year, there is a story worth passing on to highway engineers and contractors in other states.

That is why we've chosen Tennessee for the first of a series of state road program reviews. The Tennessee Department of Highways is nearing its goal of awarding $112.5 million in contract volume this calendar year—compared with $51 million in 1957. At this time when some state road programs are still dragging, despite a flood of funds, the circumstances are of interest far beyond the borders of Tennessee.

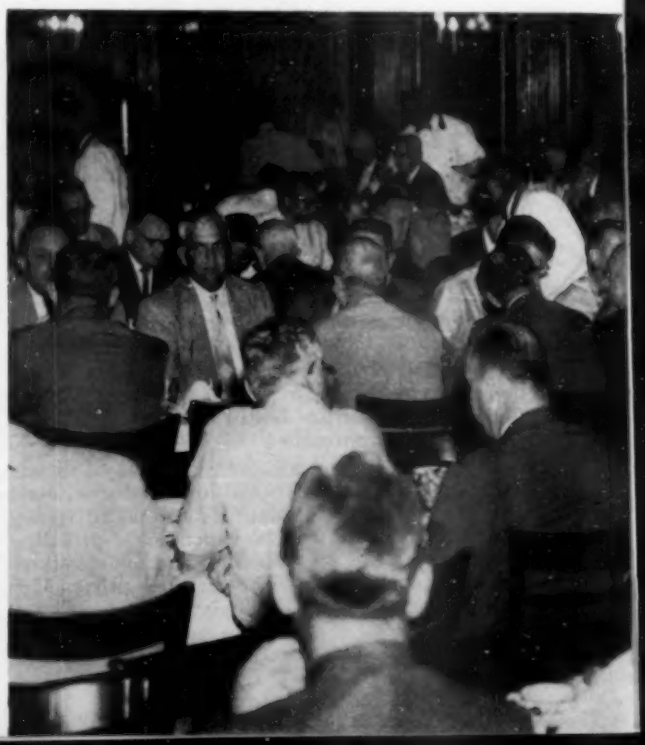
The spotlight was recently thrown on Tennessee's booming effort by political circumstances. Candidates for the governorship in the state's general election held August 7 made free-swinging promises to speed up road building, do the job cheaper, build more roads for the farmers, etc., etc. It was time, decided state highway commissioner W. M. Leech, to spell out a few basic principles and remind Tennessee people just how far their state's road program has come during the 5½ years since Governor Frank G. Clement took office in January, 1953 (his second term expires next January 1).

The occasion for this telling came on July 24 when contractor-members of the Tennessee Road Builders Association and key highway engineers met 250 strong at a luncheon, on the eve of the largest highway letting ever held in Tennessee. Speaking there, the commissioner made front-page headlines by warning that tinkering with the state's present long-range, planned road program would set the effort back years. We quote his words, in part:

"I sincerely believe that anyone who would attempt to change the planned program of construction and location of the Interstate system in Tennessee, as it has been laid out, programmed and approved by the U. S. Bureau of Public Roads, would be doomed to failure. Any such material change would result in from two to four years of total inactivity in road construction."

In elaborating on this strong statement, the commissioner said "there is no inexpensive, speedy solution to the highway problem. Regardless of what promises are made by whom, time and money will be needed to accomplish the desired results." The people of this country, he said, have not yet realized the magnitude of the highway job, nor the revolutionary importance of the freeway concept—the first basically new idea in road design since the wagon trail.

The job of locating Tennessee's 1,000 miles of new Interstate roads, he further warned, has required a long lead time. The first two years of the program since its earliest beginning were of necessity devoted to formulating policies, locating general routes, conducting location studies and handling other preliminaries. "I didn't think we could get an Interstate job going before 1959," said the commissioner. "As it is, we have 10 such jobs



IN TENNESSEE

● **Speakers at luncheon of the Tennessee Road Builders Association: Association's president, Robert A. McDowell, of McDowell & McDowell, contractors and W. M. Leech, Commissioner of Highways.**

going, and five more up for letting, and another five to be awarded in September—a real breakthrough, presaging on-time completion of the $1 billion worth of Interstate work slated for Tennessee in the 13-year program laid out."

State road awards in 1958 reached $52.5 million with the record-breaking July 23 letting of projects of all kinds totaling $21 million. The year's goal of $112.5 million is now well in sight. This will cap the effort of the administration which put $290 million capital investment into roads of all classes in the period from January 1953, to June 30, 1958. (As of July 22, some 285 road contracts were in force, aggregating $91,043,000.) Tennessee, however, ended the fiscal year on June 30 with only a little over half the projects awarded for which federal-aid funds were available to finance—showing the catching-up that needs to be done to get abreast of the flow of federal funds.

● *Factors in Program Step-up.* From various sources *Roads and Streets* found that several chief reasons can be cited for the current highway accomplishments in Tennessee:

1. Tennessee since 1953 has had a road-minded governor determined to expedite highway construction. Governor Clement tapped Leech as an able man for the commissioner job, and gave orders for full steam ahead in the belief that this strung-out state with its ageing network needed to move decisively in the interest of industrial and agricultural development.

2. Everywhere is evidence of strong leadership at the highway helm. Commissioner Leech, an attorney in private life, has shown a high concept of public service combined with administrative ability. This articulate and dedicated man-at-the-top inherited some good engineers. He has given them

(Continued on page 64)

On Eve of Tennessee's Biggest-Yet Road Letting

Tennessee's highway contractor clan, as they gathered in July for a luncheon at Nashville to hear how their program was progressing—and wait over for the largest highway letting in the state's history.

INTERSTATE HIGHWAY SYSTEM

REPORT FROM OKLAHOMA:

CATERPILLAR EQUIPMENT SPEEDS INTERSTATE SYSTEM BYPASS

In clay and rock on the eastern edge of Oklahoma City, Noland Smith Construction Co. is carving out a 1½-mile bypass to U.S. 77, part of the National System of Interstate and Defense Highways.

At work is a 100 per cent Caterpillar team of earthmoving equipment that includes: eight Cat DW15 wheel-type Tractors with No. 428 LOWBOWL Scrapers, two DW21-No. 470 combinations, two D8 and one D7 track-type Tractors, and a No. 12 Motor Grader—14 big yellow machines in all.

The job involves moving some 600,000 cu. yd. of material. Six DW15-No. 428s moved 200,000 cu. yd. on a 2,400-ft. haul. And top daily production has been 7,400 cu. yd. A D8 with No. 8 Ripper breaks up rock where necessary. 400,000 cu. yd. on a 6,500-ft. haul were moved with eight DW15-No. 428s and two DW21-No. 470s. Top daily production has been 5,600 cu. yd. Average cycle time, 11½ minutes.

As the tempo of work increases on the 41,000-mile system of superfreeways, more and more contractors are standardizing on Caterpillar equipment. A recent survey of the $415 million Illinois Toll Highway showed that 53 per cent of the equipment at work was Caterpillar.

These contractors have found that for profitable production you can't beat the combination of good machines and good dealer service. You get *both* from Caterpillar. Ask your Caterpillar Dealer today for an on-*your*-job demonstration.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

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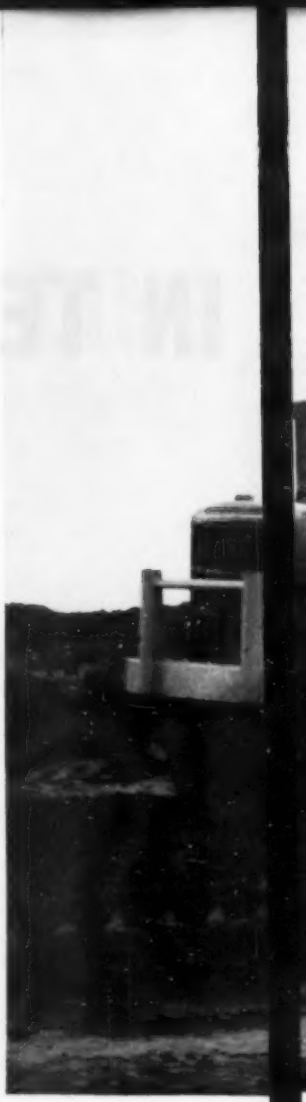


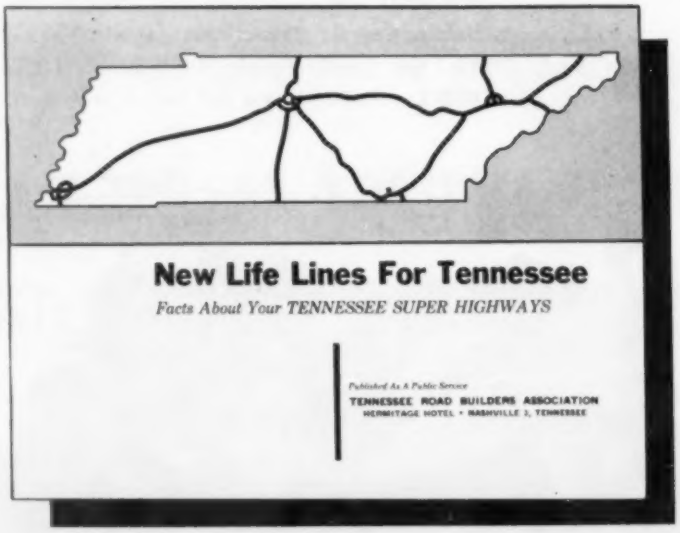
NEW BYPASS *will provide two 36-ft. main roadways and two 32-ft. service roads to U.S. 77, part of the Interstate Highway System, the greatest construction job in history.*

FAST CYCLE TIME *depends on swift, sure loading. Here a Cat D8 Tractor push-loads a DW15-No. 428 Tractor-Scraper combination. LOW-BOWL design assures a full load at every pass.*

. . . for more details circle 247 on enclosed return postal card

BREAKING UP ROCK *is this D8, equipped with No. 8S Bulldozer and No. 8 Ripper. The high-speed haul roads used by the tractor-scrapers are maintained by a Cat No. 12 Motor Grader.*

"CATERPILLAR EQUIPMENT *gives us low-cost operation and low maintenance," says owner Noland Smith. "Add to this easy loading and speed in hauling and you have top production."*


New Life Lines For Tennessee
Facts About Your TENNESSEE SUPER HIGHWAYS
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TENNESSEE ROAD BUILDERS ASSOCIATION
HERMITAGE HOTEL • NASHVILLE 3, TENNESSEE

Explaining Access Control to Citizens

Excerpts From New Educational Booklet of Tennessee Road Builders' Association

The freeway (controlled access highway) . . . is the first major innovation in the basic design of the roadway since the wagon road replaced the footpath.—Automotive Safety Foundation.

• •

The value of the Interstate highway program lies more in its forward planning than in the mere size. For the first time, we are building not merely for today's traffic needs, but for the needs of the future. In highway planning today, it is imperative to look to the years ahead because of our rapid population growth and our even more rapid increase in motor vehicles.

• •

Control of access is the key to the Interstate highway's success. Unlimited, unplanned access to conventional highways created congestion and slowed traffic as more and more automobiles used the highway. The safety and capacity built into modern controlled access highways is permanent.

• •

One survey of 2,500 miles proved conclusively that accidents were reduced by *two-thirds* by controlled access highways. It is estimated that new controlled access highways will save 4,000 lives a year and prevent one million accidents.

A recent study in the State of Michigan pointed to these conclusions: With controlled access, four-lane divided highways are almost *four* times as safe as all other types of trunkline roads.

But without controlled access, the four-lane divided highway is the most accident prone and dangerous road. Fatality rate for the controlled access highway during 1957 was 2.5 per 100 million miles and 5.0 for uncontrolled access.

As a result of this study, Michigan will no longer build four-lane divided highways without control of access.

• •

In the long run, the business of motels, restaurants and gasoline stations will increase. Better highways will cause more people to travel. They will have to find places to eat, to sleep and to service their automobiles.

There will be no commercial facilities within the right-of-way on Interstate routes, but signs will alert the motorist when he approaches connecting roads leading to these facilities and the cities and towns he may want to visit.

• •

Studies show that, in general, the business on which the community really is based, improves once the through traffic is taken off the principal streets.

(Continued from page 61)

the green light to apply progressive engineering procedures in the department. Equally as important, he has been able to sell and explain the road program, keep it out of politics, and foster an effective relationship with the contractors.

3. An early engineering start is paying off in Tennessee. Back in 1954 when the President first advocated his "Grand Plan" of highways, the Tennessee highway engineers had faith in the inevitable passage of an expanded Interstate road program, and began at once to get ready for it. Using the trickle of Interstate fund allocations from the 1954 federal-aid highway act, the department began route and location surveys. As a result, over 400 miles of Interstate locations were surveyed by the time the 1956 federal-aid act unlocked the big funds. The engineers had tied down these routes, and a number of complicated projects began to move through the design, plans-approved and land acquisition stages.

4. Steps were taken to increase the work-capacity of the highway department. New speed-up techniques have been adopted, and engineer recruitment and training stepped up. The department recently has attracted a number of civil engineering graduates from

(Continued on page 67)

Want an easy-to-install drainage structure?

use Corrugated Metal

You don't need expensive handling or lifting equipment to install a Corrugated Metal Pipe Structure. The pipe comes in long lengths ready to lay, and since it is light and easy to handle, requires less time to install. For example, three men can properly install a 20′ length of Corrugated Metal Pipe in a matter of minutes. Corrugated Metal Drainage Products made from USS Galvanized Steel Culvert Sheets do not require "kid glove" handling. If dropped, they will not crack or spall. There are no losses due to breakage. Consequently, it is only necessary to order the lengths required to complete the job.

United States Steel Corporation—Pittsburgh
Columbia-Geneva Steel—San Francisco
Tennessee Coal & Iron—Fairfield, Alabama
United States Steel Supply—Steel Service Centers
United States Steel Export Company

United States Steel

Write for our free booklet "USS Culvert Sheets" which tells you how to get the kind of service you can expect from Metal Drainage Structures made from USS Galvanized Steel Culvert Sheets. It's loaded with information about selection of correct structure sizes, preparing foundations and installation procedure. For your free copy, write to United States Steel Corporation, Room 2801, 525 William Penn Place, Pittsburgh 30, Pa.

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LIMA...built to stay on the job-
keep output up, costs down

Every day Limas throughout the world are proving their worth in every type of excavating or crane work. Carefully engineered for modern, high-speed operation, these rugged, powerful machines handle the toughest stripping, digging, loading and lifting jobs with effortless speed. Their built-in stamina assures high output with lowest downtime. Easily maneuverable they move and work in the tightest spots, getting jobs done well ahead of schedule. Fingertip precision air controls pave the way for smooth, easy operations.

Torque converter power take-off with its superior operating qualities is available on all Types. Lima quality design and construction extras make for profitable, efficient operations with minimum downtime. There's a Lima Type and size for every job—shovels to 6 cu. yds., cranes to 110 tons and draglines variable. Smaller capacities are available on rubber. For full details, contact your nearby Lima distributor, or write to Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

Limas are available in three types of mountings—crawler, wagon or truck—for all types of service.

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Shovels • Cranes • Draglines • Pullshovels • Roadpackers • Crushing, Screening and Washing Equipment

BALDWIN BLH LIMA-HAMILTON

5½ Years of Road Construction by the Tennessee Department of Highways

(January, 1953 to June, 1958)

Classification	Grade & Drain (Mi.)	Base (Mi.)	Pave (Mi.)	No. New Bridges	No. Old Bridges Widened	No. of Bridges Repaired	No. of Roadside Parks	Total ($$)
State Contracts	815.975	245.637	2,293.797	386	153	16		$186,840,421
State Forces	474.826	732.466	3,641.570	60	23	38	841	31,497,282
County F.A.S.	1,194.995	1,208.628	1,388.828	330	3			71,657,911
Rural Roads	1,799.084	3,344.648	3,000.801	30	5	—	—	
Total	4,264.880	5,531.379	10,279.874	806	184	54	841	$289,995,614

TENNESSEE ROADWORK

(Continued from page 64)

Tennessee schools, aided by 1957 legislation which cleared the way for staff salary raises. Consultants were also employed to help on selected projects.

5. The contractor's association has played a part. More on that further on.

Many problems remain in the state's program, of course. A chief one is that of right-of-way acquisition. In his talk before the contractors, Commissioner Leech candidly admitted to an error in awarding a job or two before land acquisition had been wrapped up —a lesson now thoroughly learned. Right-of-way will continue as a major matter, since the department is concentrating on urban links where congestion is acute; several major projects are under construction in the four principal population areas, Memphis, Nashville, Knoxville and Chattanooga.

The Interstate urban links are costing from $2 to $10 million per mile. The rolling or mountainous terrain puts a high price tag also on the rural segments, with the result that the estimate for reconstructing the entire 1,000 miles in Tennessee comes to about $1 million per mile at present prices.

What kind of work the Interstate projects will give to the contractors is shown in the accompanying table. Structures above culvert size will take the biggest chunk of money—$320 million in the ultimate program. Grading, drainage and minor structures come next, with $263 million. Surfacing and shoulders will total $149 million. Right-of-way will take $158 million.

● *Strong Contractor Association.* A major factor in Tennessee's highway progress is the leadership evi-

(Continued on page 75)

Tennessee's Program Based on Needs Study

In 1953, during Commissioner Leech's first year as commissioner under Governor Clement, the Tennessee state legislature created a Highway Study Commission to appraise the state's highway conditions and needs.

The Automotive Safety Foundation was appointed to direct the study, which involved a staff of over 300 at one time or another.

The study report which was released in January, 1956, was dramatized in an attractive, readable printed brochure. This report was widely distributed.

During and immediately following the study period, the state continued with a minimum program based on available funds. The expanded program made possible by 1956 and 1958 federal-aid funds, has been based largely on the findings of the study. Quoting Commissioner Leech:

"We have endeavored to follow the recommendations of the Study Commission with reference to projects advertised and let for construction, taking into consideration present and future needs. With the passage of the Federal Highway Act of 1956 and the addition of the new Interstate System, the work of the highway department was tripled.

"Of necessity, the standards and locations of the Interstate System have been controlled by the overall national policy and the standards and designs agreed upon by the highway departments of all 48 states, cooperating with the Bureau of Public Roads."

CUT YOUR BLADE COSTS 40% to 60%

Read the next 2 pages

Mail coupon on next page

PAPER, CALMENSON & CO., Department L
County Road B and Walnut St., St. Paul 13, Minnesota

Please send me additional information on savings to be made with Pacal 3-piece blade arrangement and quote me comparisons on sections I'm using now.

Number of graders_____ Length of mold boards_____

Size of blades in use_____ Type of work done_____

Name_____

Organization_____

Address_____

* NOW! More than ever it's important to use Pacal Heat Treated Plow Bolts. With the longer life of X-TRA-EDGE blades you need a bolt that has a head as hard as the blade. Pacal Heat Treated Bolts have triple strength . . . do not stretch or loosen.

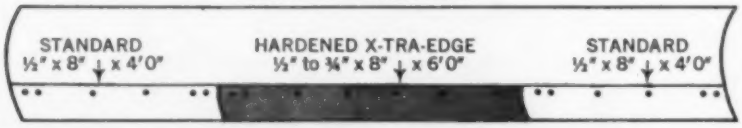
PACAL Announces New 3-piece grader blade arrangement with hardened X-TRA-EDGE

CUTS COSTS 40% TO 60%

CONQUERS EXCESS CROWNING

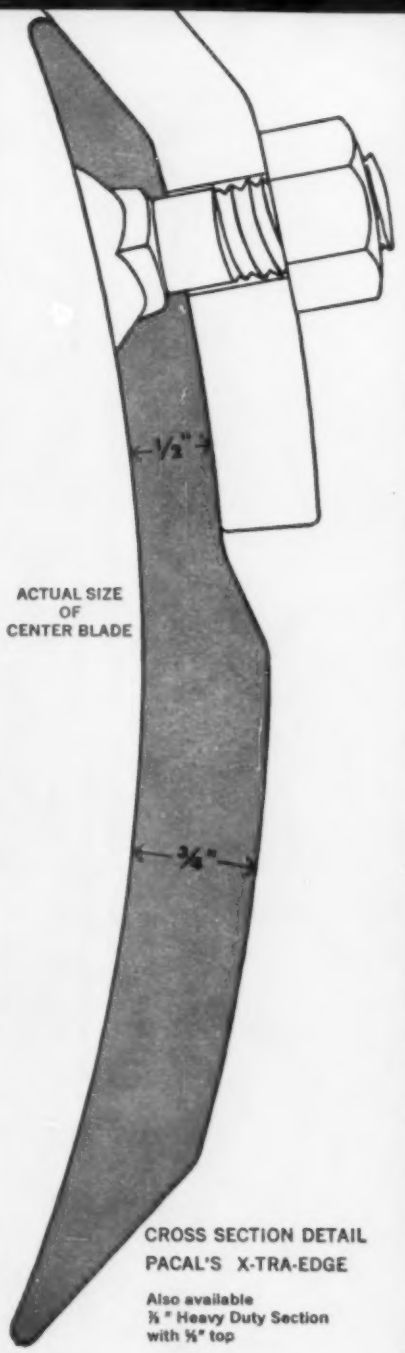
With Pacal's new 3-piece grader blade arrangement you get extra life in the wear-taking center section in 2 ways: 1. through the extra cutting-edge thickness of Pacal's X-tra-edge blade construction, 2. through the special hardening of the cutting-edge steel by heat treatment. Instead of two sections, you use three: a hardened X-tra-edge section in the center—shorter standard double-beveled blade sections at each end.

EXAMPLE: 14′ Mold Board



Pacal's new 3-piece, flush-joint blade arrangement is also available with ⅜″ to ⅝″ hardened X-TRA-EDGE center section and ⅛″ standard blade sections at each end. Combinations for all mold board lengths.

Exhaustive operating tests over a period of 4 years have proved blade costs can be cut 40% to 60%. The new Pacal blade arrangement prevents excess crowning, keeps a sharper cutting edge, reduces end-gouging and other work slow-ups, makes your equipment and operators' time count for more in material moved and miles of smooth roadway completed. Much less down-time per year for blade changes—much less bolt cost* —much less blade cost. Get full information. Mail coupon today.



CROSS SECTION DETAIL
PACAL'S X-TRA-EDGE

Also available
⅜″ Heavy Duty Section
with ½″ top

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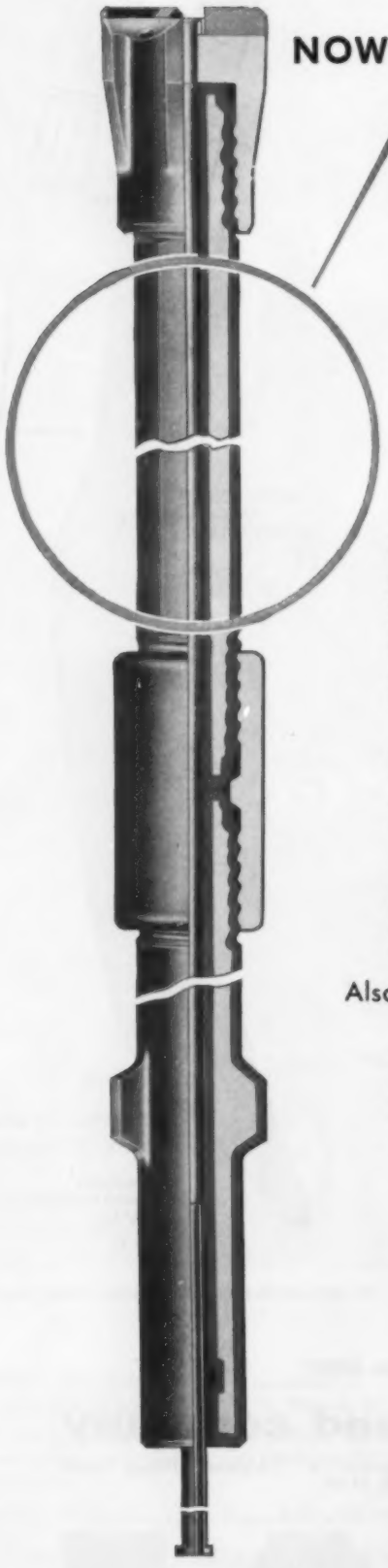


NOW CARBURIZED DRILL STEEL life that is

MEASURED IN MILES*

on the job performance proves lower cost per foot of hole when you use the ALL I-R Deep Hole Drilling Combination

* More than 6 *miles* of hole with a single steel! That's the record chalked up by an I-R Carburized Alloy Steel Rod on a Montana construction project. This "super" steel broke after 32,307 feet. Another piece broke at 24,400 ft. and another at 15,000 ft. Performance like this on hard rock, deep hole drilling jobs is the result of Ingersoll-Rands improved Carburizing process. Every steel is specially treated to provide exactly the *right combination hardness* and *core toughness* to withstand billions of heavy impacts without molecular fatigue.

And what about *bit* performance? On the same job, in hard basalt, customer keeping accurate records reported an I-R Carset bit that drilled 4,065 feet on *one* regrind. On second regrind insert still looked good with considerable footage left in the bit. Bits used were I-R non-rifling type 60X face design available in 2½", 2¾", 3" and 3½" sizes.

This is further evidence that it *pays* to use the ALL I-R Deep Hole Drilling Combination.

Carburized Shank Piece gives extra strength and wear resistance where it is needed most.

Semi-Bridge Couplings assure proper alignment between sections—permit deep hole drilling without pulling steels.

Also CARSET BITS

with Type 40 or Quick-Change I-R Type 22 Threads

Inserts, shoulder, clearance, and skirt all correctly designed for highest sustained drilling speed and maximum bit life. Available with either the Type 40 Thread or with the Quick-Change Type 22 Thread, especially designed for faster and easier detachability.

Thread	Description	Bit Sizes	Net Weight Lb.	Net Weight Oz.
Type 40	1¼" O.D. Thread, 3½ threads per inch	2"	1	2
		2⅛"	1	5
		2¼"	1	8
Type 22	1¼" O.D. Thread, 3 threads per inch	2"	1	2
		2⅛"	1	5
		2¼"	1	8

For complete information, or for an eye-opening trial order, call your Ingersoll-Rand man as soon as you can.

Ingersoll-Rand

15-841 11 Broadway, New York 4, N.Y.

A CONSTANT STANDARD OF QUALITY IN EVERYTHING YOU NEED FOR DRILLING ROCK

. . . for more details circle 278 on enclosed return postal card

Look ahead
...*move ahead*
...and stay ahead
with
Allis-Chalmers
crawler tractors

first choice on more and more tough jobs

Four big advantages stand out in the coast-to-coast swing to Allis-Chalmers crawler tractors:

- **outstanding work capacity**
- **real dependability under severe conditions**
- **easy maintenance and lubrication**
- **timesaving, cost-cutting service**

As a result, Allis-Chalmers users bid closer to the belt, set schedules with more confidence, end up "in the black." So before you buy your next tractor, take a close look at *these* machines . . .

There's an extra measure of

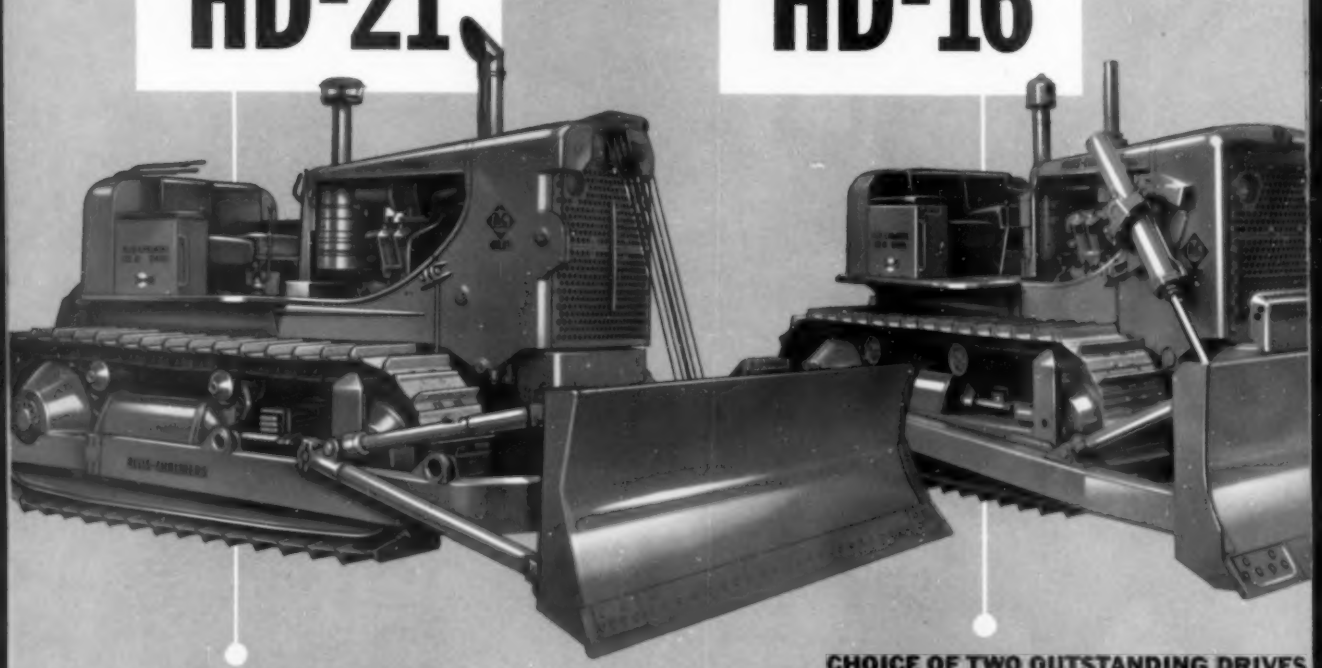
IN EVERY SIZE

ALLIS-CHALMERS

HD-21

ALLIS-CHALMERS

HD-16



225-hp turbocharged engine
Hydraulic torque converter drive
56,260 lb (approx. as shown)

The new HD-21 brings you live power for today's big-tractor jobs—and torque converter drive puts it to work automatically. The HD-21 offers more work capacity—dollar for dollar—than any other big crawler tractor you can buy.

HD-21A illustrated—Two other models available

CHOICE OF TWO OUTSTANDING DRIVES

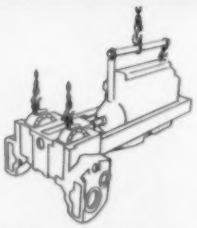
Hydraulic torque converter	All-gear
150 net engine hp	141 belt hp
39,090 lb (approx. as shown)	125 drawbar hp

Get up on the HD-16 yourself—and see how it handles jobs ordinarily assigned only to bigger, more expensive crawler tractors. You'll sell yourself—just as more keen-eyed construction men do every day.

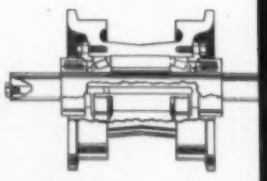
HD-16DC illustrated—Five other models available

Pioneered and proved by Allis-Chalmers Engineering in Action

Torque Converter Drive gets more work done—automatically provides the right pull or push for every load, at maximum speed for existing conditions. *(Available in HD-21 and HD-16 only.)*



Unit Construction saves valuable time . . . lets you remove any major assembly without disturbing adjacent assemblies.



1,000-Hour Lubrication intervals for truck wheels, idlers, support rollers . . . changes daily greasing time into production time.

THE ONLY COMPLETE LINE OF CRAWLER TRACTORS THAT

performance and dependability

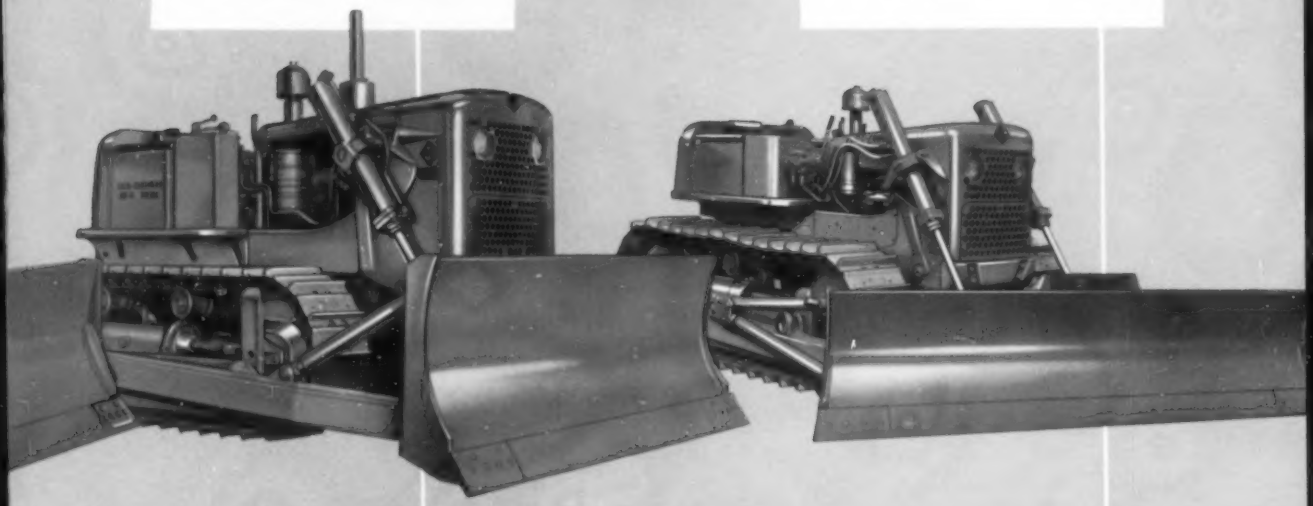
A SIZE FOR EVERY JOB

ALLIS-CHALMERS

HD-11

ALLIS-CHALMERS

HD-6



94 belt hp

25,960 lb (approx. as shown)

The HD-11 is setting new standards in its size range . . . offers you dozens of work-boosting advantages, including the industry's easiest shift pattern. A single shift takes it from any forward speed to any reverse—gets short-cycle jobs done faster, easier.

HD-11B illustrated – Two other models available

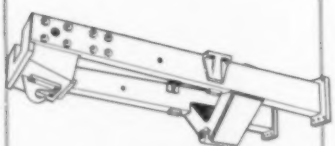
63 belt hp

16,470 lb (approx. as shown)

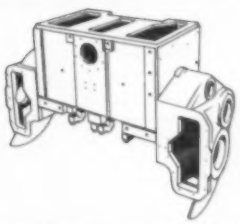
Here's up to 15,500 lb drawbar pull. The HD-6 is the only tractor near its size with big-tractor design advantages—for example, All-Steel Box-A main frame and engine-mounted dozer with direct-lift cylinders for improved weight distribution, accurate dozing and long life.

HD-6E illustrated – Three other models available

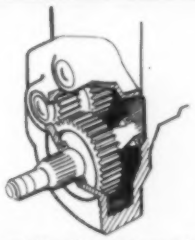
True-Dimension Track heat-treated and machined in the industry's most modern facilities, is setting new track-life records on every type of work.



All-Steel Box-A Main Frame soaks up shock and strain . . . provides improved weight distribution and equipment mounting.



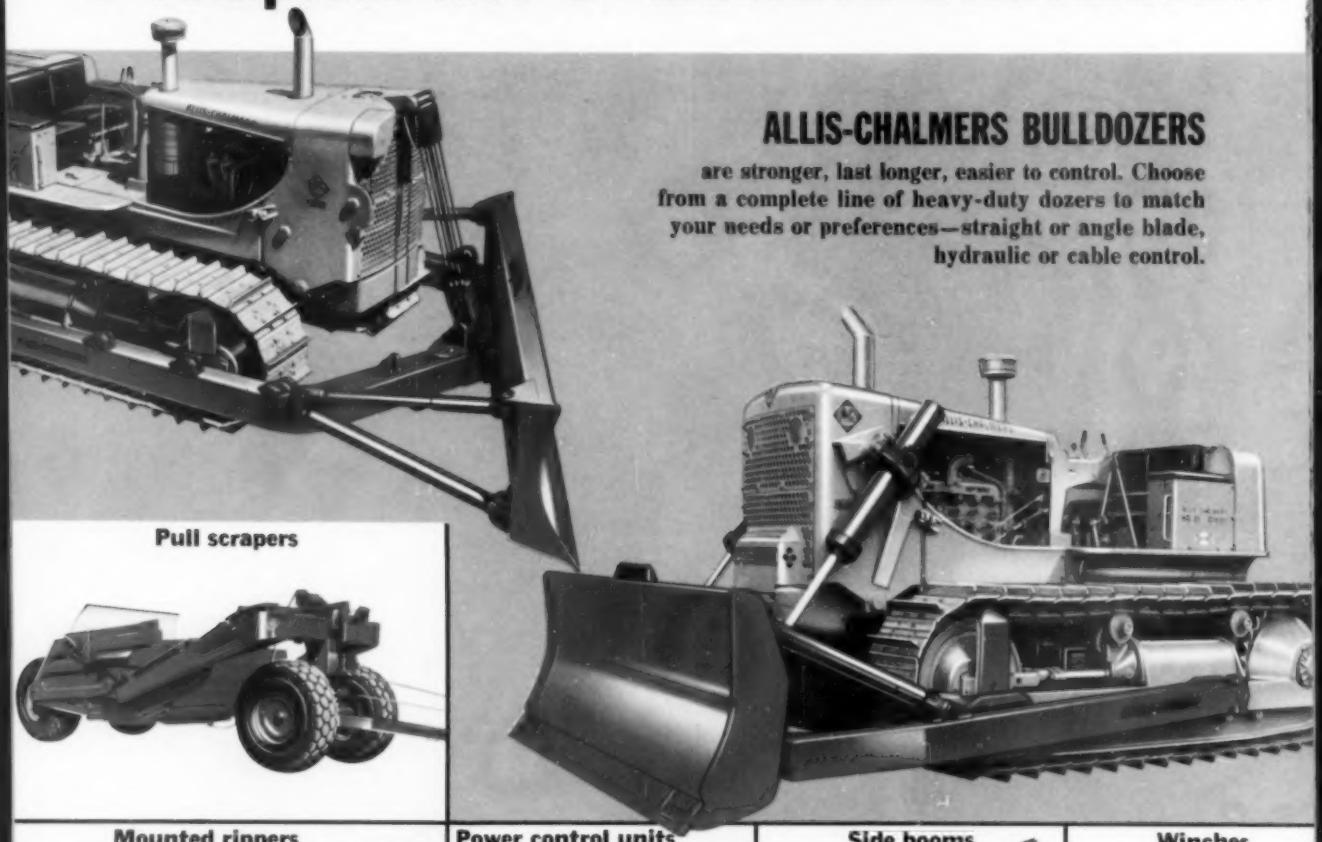
One-Piece Steering Clutch and Final Drive Housing with extreme rigidity and strength . . . line-bored to provide precise alignment of gears and shafts.



Straddle Mounting of All Final Drive Gears with tapered roller bearings on both sides of short, large-diameter shafts . . . provides extra gear life.

GIVES YOU ALL THESE ADVANTAGES IN EVERY SIZE..PLUS

a complete line of matched attachments



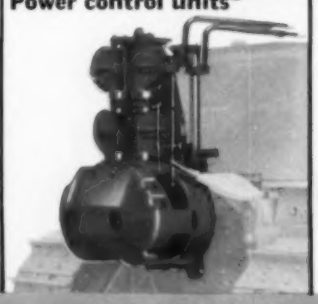
ALLIS-CHALMERS BULLDOZERS

are stronger, last longer, easier to control. Choose from a complete line of heavy-duty dozers to match your needs or preferences—straight or angle blade, hydraulic or cable control.

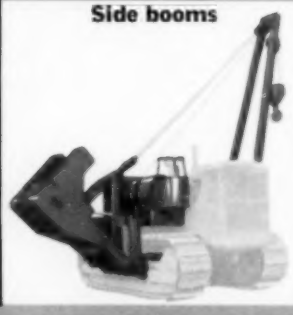
Pull scrapers

Mounted rippers

Power control units



Side booms



Winches

A demonstration on your job will prove their value . . . call your Allis-Chalmers dealer now.

Look ahead...*move ahead*...and stay ahead

ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

ALLIS-CHALMERS

FORM MS-1303

LITHO. IN U.S.A.

Job Classification Booklet

Another accomplishment of the Tennessee Road Builders Association is the preparation of a handy little booklet which defines the various job classifications involved in state highway contractor work. This booklet is expected to help avoid misunderstandings and maintain harmony between all parties on Interstate projects.

Prepared with the help and approval of Tennessee's departments of Labor, Highways and Public Works, the booklet defines several score of jobs, ranging from Air Tool Man to Winch Truck Operator.

Other chapters include a discussion of federal labor laws and regulations, particularly the Davis-Bacon Act, as reviewed in a talk by Stuart Rothman, U. S. Solicitor of Labor; an outline of rules, regulations and interpretations of the Prevailing Wage Scale Statute, as it applies to Interstate road projects; and notes on Tennessee's new county-zoning for future wage scale decisions. The publication is the result of many conferences between the Association's Labor Liaison Committee and state labor and highway representatives.

TENNESSEE ROADWORK

(Continued from page 67)

denced by the Tennessee Road Builders Association under its executive secretary, Leslie T. Hart. This strong, aggressive group has worked for its members' own interests, of course, but with the concept that these interests are best served when they coincide with sound roadbuilding practices. Through committees the association has helped iron out mutual problems with the department engineers. It has helped work toward quality construction, a point which Commissioner Leech covered in the following comment:

"A contractor takes pride in complying with specifications, just as an attorney is proud of his part in a trial where justice is done . . . conversely no contractor enjoys seeing one of his roads go bad because of poor workmanship."

The Association at the July 24 luncheon unveiled a major contribution to the highway promotion effort—a pictorial booklet, "New Life Lines For Tennessee." Prepared with the help of the Tennessee Department of Highways, Automotive Safety Foundation, American Road Builders Association, and other sources, this highly readable publication pictures what good highways mean to the citizen, why access-controlled highways are so necessary, what the citizen's rights are when his property is being taken, and how modern highways are cutting the accident rate.

(Continued on page 78)

Sen. Gore Re-Nominated

Believers in a strong road program were victorious in the August 7 election in Tennessee.

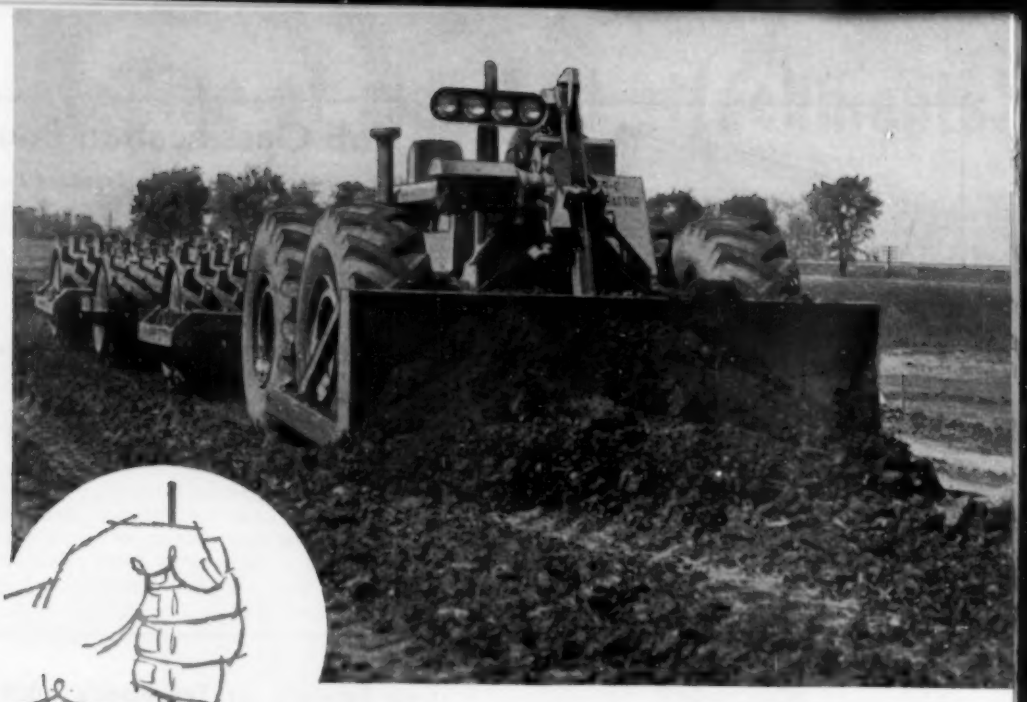
Albert Gore (Tenn. D.) was re-nominated to a second U. S. Senate term, with election assured. As chairman of the Senate's Subcommittee on Roads, he has been a leader in shaping the big national highway program and fighting against its threatened stretch-out. (His adversaries campaigned to unseat him on the claim that he devoted too much attention to national affairs, and not enough to Tennessee's welfare.)

Buford Ellington, governor-nominee, who will succeed Governor Clement January 1, is a believer in the sound road program principles, and has promised to "push the program with all his might."

Cost Estimate for Tennessee's 1,000-Mile Interstate Highway Program

(Estimated figures compiled in 1957 and brought up to date. The totals do not include a new route, not yet approved by the Bureau of Public Roads, leading northwest from Nashville toward Cairo, Illinois.

Item	Estimated Cost (Millions)
Structures	
Railroad grade separations	$ 24.8
Highway grade separations, without ramps	58.5
Complete interchanges	117.8
Bridges and tunnels	111.9
Walls, etc.	6.9
TOTAL STRUCTURES	$ 319.9
Clear, grub, demolition	$ 10.0
Grade, drain, minor structures	263.0
Base, surfacing, shoulders	149.0
Utility adjustments	15.3
Guard rail, fencing, lighting, traffic controls	28.2
Roadside development	14.7
Preliminary engineering	33.9
Right-of-way	158.0
Other items	2.3
Construction engineering and contingency	80.3
TOTAL	$1,073.6



BALANCE

your tractor fleet for extra profit...

When you plan dirtmoving contracts, you are usually faced with a wide variety of tractor assignments.

The question is: What kind of tractor — crawler-mounted or rubber-tired — will pay-off best in the work you're handling?

Repairs access road to isolated farm

Farmer's access road 5 miles down the pike is washed out. He can't get his pick-up out to the road, can't move his produce to market. Your Tournatractor is on the job in 20 minutes... repairs road in 20 minutes... is back on its regular job in another 20 minutes. You've saved money, made friends.

Hires out for plus profits

A property owner near your job wants land leveled for building site, or drainage. You "borrow" Tournatractor from production fleet ... send it over highways, through city streets to the work site. Whole job takes only a few hours. Tournatractor earns $75 or so extra pay ... without delaying the main job.

Balances production — cuts moving time

When your production fleet moves, self-propelled scrapers roll over highways to the new job. Tournatractor rolls with 'em. Scrapers can begin work on arrival, if a Tournatractor is used to push-load. (Crawler-pushers are usually latecomers since they must be loaded on flat-beds, hauled to job site, and ramp-unloaded.) When short hauls bunch-up your scrapers in the cut, again drive in Tournatractor. This tractor will quickly balance your pusher operation, until longer hauls get your production fleet back into efficient spacing.

Clears right-of-way for production earthmovers

While your heavy-duty crawlers grub out stumps or break up shale, there's plenty of rough work that a speedy tractor-on-rubber can handle . . . scattered work that will get your production haulers working sooner. Use a Tournatractor to pile logs, stumps, and brush, build and maintain haul roads, doze boulders, clear turn-around areas, connect access roads, cut drainage ditches to keep borrow pits and haul roads dry.

Big, 2-ft wide tires aid compaction

Material on fill is piling up fast. It needs continuous compaction or it will delay scraper cycles. Tournatractor levels high spots with its dozer blade, at the same time it pulls a 35-ton, 6-drum sheepsfoot roller. Tournatractor's 2' wide tires, carrying 20 tons of weight, combine prepacking with heavy 30 to 50-ton follow-up for most effective compaction.

Quickly reconditions mucky haul roads

Your heavily-loaded scrapers cut deep ruts into wet haul roads . . . slow production cycles. Tournatractor, called from an assignment a mile away, can be regrading damaged haul road in 5 minutes. With quick forward and reverse passes, Tournatractor dozes in fill, levels surface, cuts a trench to improve drainage . . . puts production scrapers back on schedule. In fact, it's profitable on most jobs to have this quickly available unit patrol your heavily used haul roads several times a day.

For heavy, short-haul work? For scattered work?

For most heavy, short-haul work . . . for dozing in rock-filled earth . . . and for "stay put" work in limited areas . . . slow-moving crawler-tractors fill the bill, because they have more lugging power at slow speeds.

For work where travel range is important . . . for leveling scattered fill . . . towing "part-time" scrapers . . . cleaning up . . . maintaining haul and access roads . . . push-loading . . . finish-grading . . . and doing dozens of "chores" scattered over a wide work area . . . your best bet is today's improved 210-hp, 17-mph, rubber-tired LeTourneau-Westinghouse Tournatractor®.

Crawlers to "lug" . . . tires to "run"

To handle your work at lowest cost you'll want to team L-W Tournatractors and crawlers in proper balance . . . using crawlers to "lug" and Tournatractors to "run."

Of course, as every project varies, you can't work out an exact mathematical formula between crawlers and rubber tires. Start with rubber-tired tractors where you obviously need most of their speed and maneuverability. Then, extend your rubber-tired percentage as you find it profitable for your operation. Keep in mind, as you plan, the growing importance of mobility in today's bigger, large-area dirtmoving jobs.

Some contractors say a tractor fleet should be evenly balanced . . . half "track," half "rubber." Others find that one Tournatractor does the work of two crawlers on their particular operations, and plan accordingly.

We've pictured here, some typical circumstances where a work-and-run tractor-on-rubber helping on your contracts, will bring you maximum profit.

Cuts emergency drainage ditch

Rain forecast for tonight . . . could easily flood poorly-drained cut in spongy clay . . . could side-line your production fleet for days. In 10 minutes, speedy Tournatractor drives 2 miles . . . soon digs drainage ditch, then smooths cut and haul roads to eliminate water pockets. No production delay today! And, come heavy rains tonight, the dirt will still roll on schedule tomorrow!

CT-1517-DC-2

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

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TIME AND MONEY SAVERS... BY Dorsey

Removable Gooseneck
Model RG
15 to 35 ton capacities

Dorsey's patented hydraulic system makes one-man operation a practical reality, which means a driver can load and deliver self-propelled equipment without assistance.
A self-contained hydraulic power unit is now standard on the RG, which means it can be pulled by any tractor.
20" tires and full spring tandems are also standard, making RG ideal for highway operations as well as on rough terrain.
Deck can be raised or lowered while loaded and in transit to pass over or under obstructions.

New Dorsey
HYDRAULIC DUMP TRAILER

Frameless design adds thousands of pounds of payload capacity to the Dorsey Dump Trailer, and it's ruggedly built to stand up under the extra tonnage it can haul.

Heavy-duty telescopic hoist is placed at the extreme front to utilize the tilt principle instead of lift, reducing strain and wear on hoist and hydraulic system.

High-strength steel arms stablize the unit when dumping. During last degrees of lift, tandem front wheels are raised and weight rests solidly on rear axle with springs out of action.

For the full details on any of Dorsey's complete line of heavy-duty trailers, call your Dorsey Low Bed Distributor.

DORSEY

DORSEY TRAILERS
ELBA, ALABAMA

. . . for more details circle 258 on enclosed return postal card

TENNESSEE ROADWORK

(Continued from page 75)

The initial 20,000 printing will be distributed to newspaper editors, chambers of commerce members, civic groups, women's clubs and others. (Readers in other states wishing a copy as a guide for preparing similar educational matter can secure one by writing Leslie T. Hart, Executive-Secretary, Tennessee Road Builders Association, Hermitage Hotel, Nashville, Tennessee.)

Davis-Bacon Rulings

Stuart Rothman, Solicitor of Labor for the U.S. Department of Labor, in a recent speech explained several pertinent points in connection with the Davis-Bacon Act.

One is the fact that one employee may be worked in several different classifications in the course of a day. This is entirely proper, and it is also proper to pay for the lower classification at a lower rate than the hours worked in the higher rate classification. It will be necessary to indicate the double status of a particular man on the payroll. If the contractor fails to do this, he may be forced to compensate the employee for the full day at the highest rate.

Mr. Rothman stressed the importance of classification which is the chief source of complaints. Some firms have classed workers as laborers, paid them as laborers and worked them in higher classifications such as carpenters or cement finishers. Such improper classifications are the first point examined by the enforcement officer, if and when he comes on the work.

Another point of violation is the failure of the contractor to post his wage rates on the work. The Act requires that the predetermined wage scale must be posted in a prominent place on the site of the construction. This violation is rather common on highway work and may be regarded as failure to comply with the law.

The industry will have to live with the Davis-Bacon rates, procedures and enforcement. It may be broadened to cover all highway projects at some future date. The points listed here are those which will help our firms to keep out of trouble.

1565 CFM OF 110 LB. AIR FOR BRIDGE CLEANING: Runnels Industries used these 3 Jaeger rotary compressors (two 600's and a 365), connected to a 3″ air line, to supply twelve 5/16″ sandblasting nozzles spread out over a mile along Tacoma Narrows Bridge, Washington. They operated 10 hours a day at 110 lbs. pressure. Under such full loads, the 100-150 rpm slower speed of Jaeger compressors saves fuel and wear and tear on engines every day you work.

3 COST-SAVING IDEAS ON ONE JOB: This job, by Rambore, Inc., drilling specialists, was 280,000 cu. yds. of rock, mostly granite, in depths to 40′, on Massachusetts' Southeast Expressway. One of their good ideas was to hook up their drills and compressors through 1500′ of easily portable 5″ aluminum pipe. This saved frequent moving of compressors over rough terrain. Secondly, they used 4″ drills with 12-edged bits made to their special design for hard rock. Their third good idea was to power these 7 drills with 3 Jaeger Model 600 compressors, which deliver the same air at 1650 rpm that others produce at 1800 rpm, at a very substantial saving in fuel.

Using the same engine, Jaeger gives you 600 cfm of air at 150 rpm slower speed

You buy few items of equipment in which the superiority is so easily measured as in a Jaeger rotary compressor. For example: There are six 600 cfm rotary compressors on the market powered with the same GM 6-71 diesel engine. Five of these operate at 1800 rpm to produce rated volume. The sixth, the Jaeger, delivers the same volume at only 1650 rpm.

In one 8-hour shift this difference amounts to miles less engine piston travel, as much as 72,000 fewer compressor revolutions and a substantial saving of fuel. Jaeger 125, 250 and 365 cfm units, with 1700 rpm full load speed, are comparably efficient.

This explains why Jaeger users enjoy such low engine maintenance costs, and why many Jaeger rotaries have logged more than 8000 hours without a single vane replacement. Ask your Jaeger distributor for full data and demonstration . . . or send for Catalog.

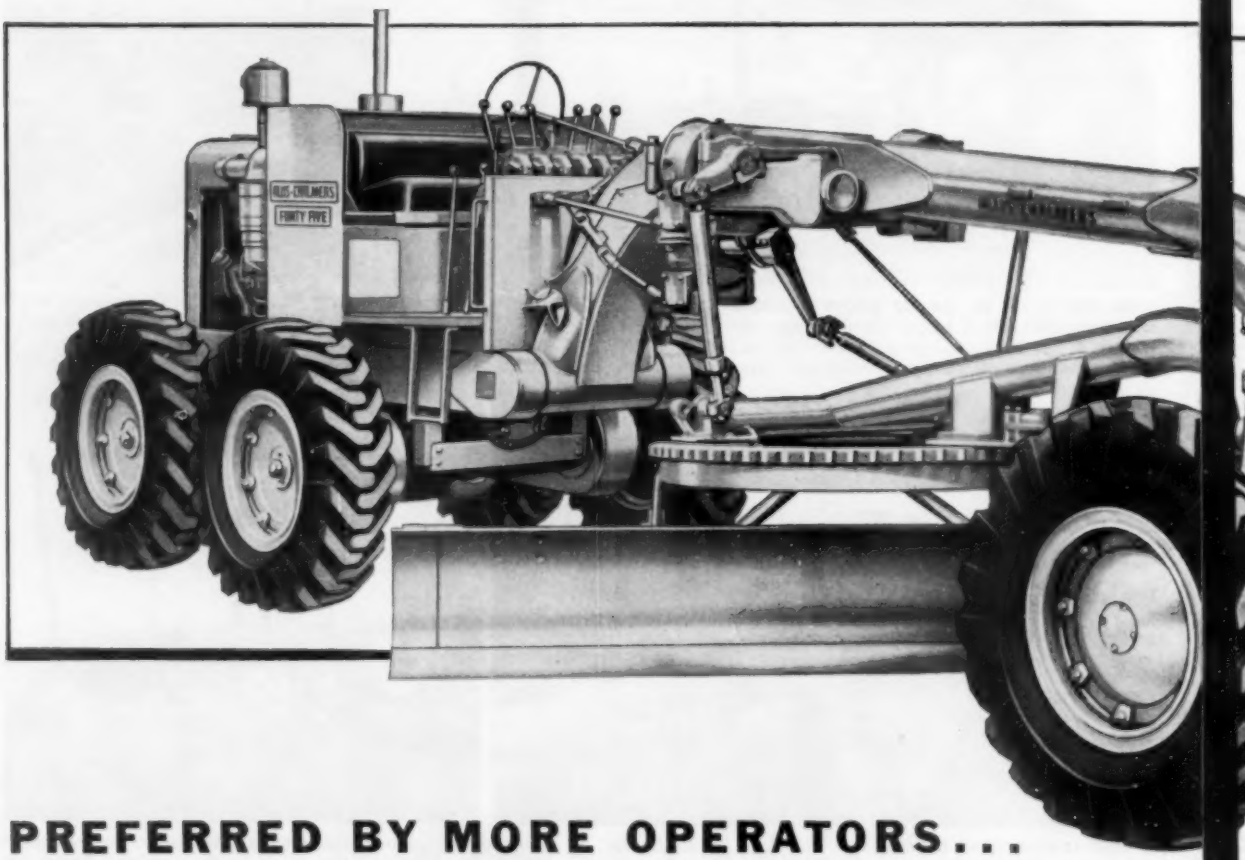
THE JAEGER MACHINE COMPANY

223 Dublin Avenue, Columbus 16, Ohio

Jaeger Machine Company of Canada, Ltd., St. Thomas, Ontario

. . . for more details circle 282 on enclosed return postal card

For consistently tough jobs, compare with any other heavy-duty motor grader



PREFERRED BY MORE OPERATORS... BOUGHT BY MORE USERS EVERY DAY

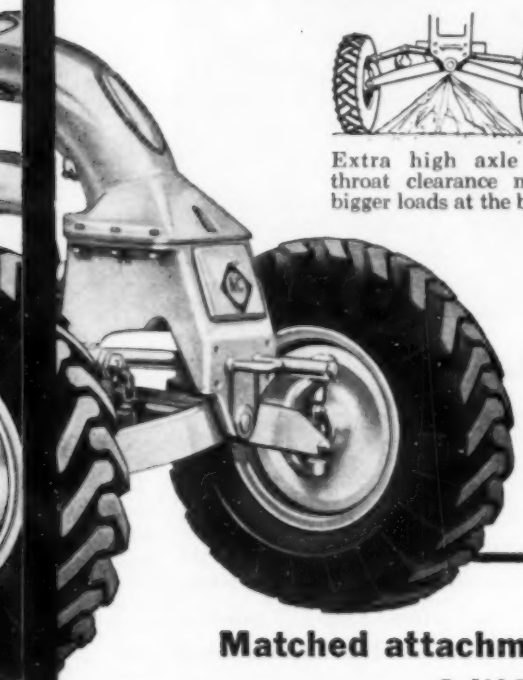
The FORTY FIVE has the power, weight, traction and speeds you need for high-production grading. Superior stability and precision control give you deep precision cuts or smooth finishes. The FORTY FIVE is built to take the shocks and strains of heavy-duty service — and to keep production steady. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

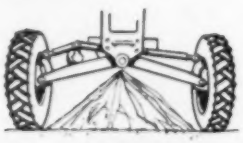
Look ahead... *move ahead* ...and stay ahead with **ALLIS-CHALMERS**

Allis-Chalmers FORTY FIVE performance

- 120 brake hp
- 6 forward speeds to 20.6 mph
- 3 reverse speeds to 7.0 mph
- 23,800 lb approx.

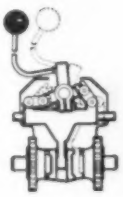
Advantages that mean more production . . . less maintenance . . . easier and better operation





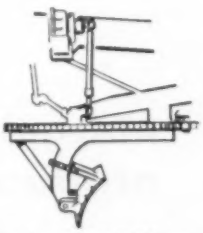
Extra high axle and throat clearance means bigger loads at the blade.

The ROLL-AWAY moldboard rolls dirt, gives more performance per horsepower, more production per gallon.



Toggle-type controls are exclusive with Allis-Chalmers.

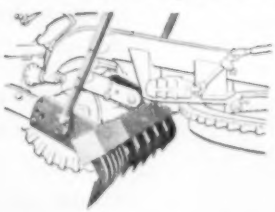
Fully enclosed power steering — easy control under all conditions.



Front-mounted lift cases eliminate long shafts that twist under loads.

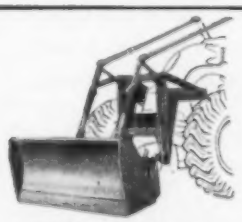
Matched attachments and accessories make it a year-round producer

All-steel, stand-up cab

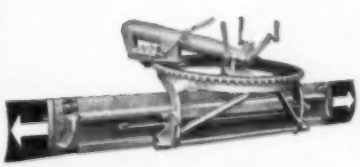


11-tooth, V-type scarifier

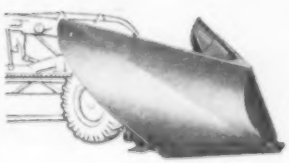
Hancock elevator



8-foot bulldozer



Hydraulic, shiftable moldboard



V-type snowplow

ROLL-AWAY is an Allis-Chalmers trademark.

. . . for more details circle 238 on enclosed return postal card

SPEEDS CAST-IRON PIPE INSTALLATION

Marcelletti & Son doubles daily production with fast-digging Cleveland

A fast-digging Cleveland 110 trencher enabled Emil Marcelletti & Son of Bedford, Ohio to make the most of the speedy pipe-laying made possible by new quick-connecting, bell-and-spigot type cast-iron pipe on this water line installation in North Ridgeville, Ohio.

Marcelletti's daily production, before putting the Cleveland on the job, had been limited because the backhoe method he was using didn't open trench fast enough to stay ahead of the swift moving pipe-laying operation. The 110 quickly doubled his daily production, on some days turning out nearly 3 times the trench footage he had been getting.

"The 110's high, reliable production and its ability to get by obstructions in narrow quarters really paid off for us on this job," says Jim Marcelletti, secretary-treasurer of the firm. "It's quick-shifting conveyor let it dig right by hundreds of trees, poles and hydrants along the trench line, obstructions that had previously slowed up our trenching operations."

accurate • fast • dependable • clean
—there's nothing like a Cleveland for trenching

Good Everywhere

The CLEVELAND TRENCHER Co.

20100 St. Clair Avenue • Cleveland 17, Ohio

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● **Side view of the installation shows double bunker simultaneous loading of 25-ton truck, with raw input feed over a full 120 sq. ft. of screening area by Kolman loaders.**

Twin Loaders Help "Save" Big Job

Contractor doubles up on all machines to make profit despite bidding $950,000 too low. High-speed pit operation here described for handling 530,000 tons of subbase material on California's longest single highway project.

BY DOUBLING UP on equipment practically across the board, including a pair of special loaders in the borrow pit, a huge 29½-mile long highway project is being pulled out of the fire. Fredericksen & Kasler bid the project $950,000 too low; left nearly a million dollars "on the table" between its $5½ million bid and that of it nearest competitor. But the production-minded efficiency-conscious outfit is using methods which are whipping costs right down the line.

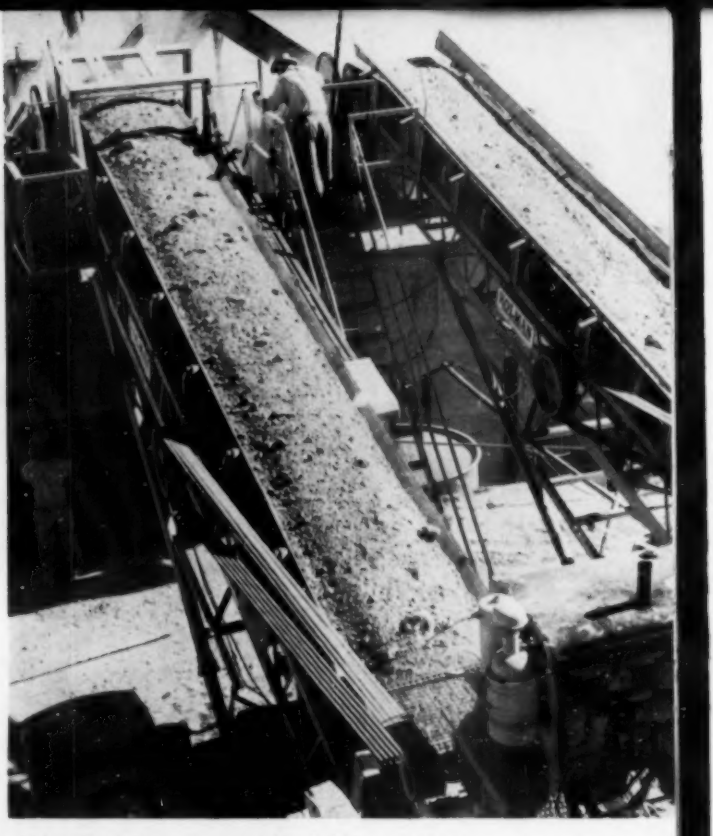
Dual Kolman 101 loaders, fed by scrapers and dumping through special oversize Kolman heavy-duty screens, are handling the entire output of subbase material. Tonnage is coming out of this pit so fast that two sets of Murphy scales are needed to weigh the loads. Cement treating of the base will be a double-barreled operation, using two roadmixing machines simultaneously. Even the bituminous paving job will use two spreaders, and special pickup loaders to eliminate their stopping between loads. The only single thing on the project is a water pipeline; this 8-in. line, boosted by 300 hp pump pressure, furnishes 3,000,000 gal. per day. It's a man-sized operation.

● **This triple-roll crusher's purpose is to handle oversize material and feed it back into the mix. Fine portions of the pit can be salvaged because of this blending provision. Cat diesel in foreground.**

In miles, the job is the longest ever let in one contract by the California division of highways. The project is a completely new 29½-mile relocation of U.S. 66 between Victorville and Barstow: four lane divided construction, limited access. The new road will cut five miles off the present highway distance between these cities.

● *Subbase is Focal Cost Point.* When the smoke had cleared after the bids were opened, Fredericksen & Kasler's management checked and rechecked their estimates, and there was only one thing wrong. The company had simply bid too low under the next-high competitor. The firm is one of California's most experienced highway contractors, and it bids close on many a job it wants especially to get. This one, largely in a wide-open desert where efficiency in mechanization could be developed to the utmost, was such a job. The $950,000 difference

● Grizzly rails kept anything bigger than 8 in. out of the plant, as hauling units belly dumped into the hopper. Twin Kolman conveyors are shown in the background.



● Loaded conveyors of Kolman loaders move material fast.

● Crushed rock and pit run material meet in closed circuit on Kolman screens.

was irrevocably lost, but by proper methods and equipment use, the job could be done profitably.

One of the critical items which had to be handled right was 530,000 tons of subbase material, which the firm bid at 60 cents per ton—processed, dug, screened, blended to meet specifications if necessary, and laid down. This is the granular ballast which, later on, will be cement treated for 6 in. of its 8-in. depth. Specifications call for 100 percent passing a 1½-in. screen; 35-65 through the No. 4; 15-40 through the No. 30, and 3-15 through the No. 200.

To bring this material out profitably, a near-perfect pit had to be located and worked to perfection too. The company's assistant general manager, Jeff Kasler, and his brother, chief engineer Jerry Kasler, went even beyond the search California's engineers had made. And they found the "perfect" pit.

It lay almost dead center through the project, and only ½ mile north of the new highway. It was on Government rather than private land, so royalties were saved. To establish a precise, pinpointed working control when the pit was under production, the Kaslers had the 2,000 x 2,000 ft. area sample-drilled on 100-ft. centers, and pit-run sizes were carefully tabulated.

"After you get to digging in a pit, you can't tell much by observation," Jeff Kasler explained. "By knowing exactly where the different gradations are, we can shift around if necessary to pit-blend and meet specifications. And in extreme cases—since we know that some of the pit material is heavy on fines—we can crush some of the oversize and blend it back."

The pit alluvium is from 5 to 20 ft. deep, and ranges from sandy material to occasional boulders up to 12 in. in diameter.

Figuring the preliminary plant set-up on a rough basis, the Kasler's realized they needed to handle a lot of production: at least 10,000 tons a shift on a sustained, breakdown-free basis; more than that on peak days. It was this sobering requirement which the Kaslers faced up to as they studied how best to handle the material.

● *Twin Loaders Selected.* Fredericksen & Kasler had the scraper fleet needed to move the pit tonnage easily; the problem was to select the proper high-speed handling equipment where the scrapers dumped. One of the most efficient ways to get rid of scraper loads was by belly dumping over a gravity hopper. With that decided,

the hopper was designed for about 50 tons capacity. Highland Machinery Co., of San Bernardino, built that portion of the system, along with the grizzly rails which automatically take out plus 8-in. chunks.

The company had purchased a Kolman 101 loader, 60′ x 42″ in size, which it had used with great success for two years. In the meantime, the Model 303 had been introduced, with considerably larger capacity. The Kaslers investigated the Model 303, and while they were impressed with its high, heavy duty performance capacity, a second 101 was the machine selected. Reasons were as follows:

1. The two machines, placed side by side, would handle as much material as the 303, and by dumping each unit over an individual bunker, twin dumping points could be created for faster truck loading. One operator could control the two 101's.

2. The two-machine combination can handle those rare mammoth jobs, with astronomical quantities; yet may be separated at other times to work smaller jobs some distance apart.

3. On a set-up where the units work together, breakdown of one of the units still will let the hauling scrapers operate at half capacity—enough to make expenses without wasting entirely the wages which must be paid to operators if they show up.

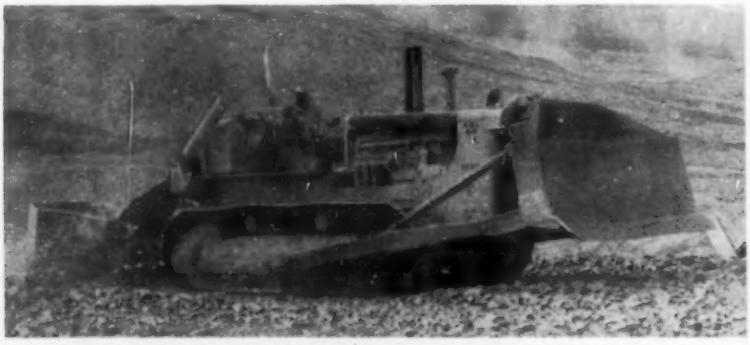
4. The Model 101's screening system could be operated either with screens mounted over surge bunkers, as on this job, or from jackleg supports attached to the end of the conveyor loader.

In connection with the screens, it was necessary to get Kolman Manufacturing Company to make larger, heavier-duty screens than it had ever supplied before. Prior to this job, this manufacturer had limited its screen sizes to a maximum of 10′ x 48″. For this job, heavy-duty 12′ x 60″ screens were made for each of the 101 loaders. While the screens can be driven from the loader drive pulley, the Kaslers decided to put independent 10 hp electric motors on each screen, leaving the full power of International UD-281 industrial engines to drive the heavily loaded conveyor belts.

This equipment was set up and

(Continued on page 90)

● **Double pusher loading, even on short haul work, made certain that the scrapers would arrive over the bunker with full loads.**



● **Cat D8 with special drag blade backs under conveyor screen dump points, cleans up and drags oversize material out of the way.**

● **Close-up view shows special drag blade mounted on Kelly ripper support behind the tractor.**

● **Everything on the job was doubled for extra production, even these Murphy scales. Trucks, weighed simultaneously, then split directions at the highway; one hauls east; the other west.**

From Liberty Mutual: a forward-looking concept

of workmen's compensation coverage which provides

Protection in

—the real key to lower insurance

The real cost of your compensation protection is not the first price, but the final cost

Any insurance company or agent can quote you a price on business insurance for your people and your assets. Yet the ultimate cost of your coverage is, in a very real sense, determined by you. If you have an unfortunate number of accidents and suffer large losses over a period of time, you are actually contributing to a higher insurance rate for yourself. Anything you can do *now* to cut down on accidents and losses will help toward cutting your premium costs *in the future*.

This is why Liberty Mutual – the company with the largest experience in workmen's compensation service – has developed over the years a forward-looking concept of business insurance which gives you protection in depth. From the start of your Liberty coverage, a wide range of skills and resources can be put to work to help you anticipate and avoid accidents and loss, lessen their impact if they happen and keep future costs down.

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This kind of protection has enabled Liberty Mutual to set an impressive cost-cutting record. In turn, this has meant steady growth in business written and a large share of "blue-chip" accounts. Because we deal directly, our salesmen have at hand the experience of the entire company to draw on, and they are expected to have the skill to see that it is applied to the problems of any policyholder, large or small. This direct-dealing, mutual form of operation not only helps policyholders control loss, but is also one reason why over the years Liberty has been able to return more than $455 million in dividends to policyholders.

We believe that protection in depth can today lead to significant improvement in your insurance cost picture. We invite you to become acquainted with protection in depth now.

depth

costs today

Power under control. To protect buildings from damage from blasting, Liberty engineers developed an instrument which measures ground vibrations, tells exactly how much dynamite can safely be used in a specific locale. Result: fewer accidents, safer working conditions.

Finding trouble before it happens. A Liberty construction engineer checks the scaffolding on a job to make sure it's strong – and safe. Result for policyholders: fewer lost-time accidents, lower insurance costs in the future.

Test for tiredness. At Liberty's research center, a "worker" goes through his paces so that our scientists can learn to measure human effort and fatigue. Goal: new knowledge of when worker efficiency begins to fall off, cause accidents.

Behind *PROTECTION IN DEPTH* is the broad range of Liberty's special skills and resources

The services available to Liberty Mutual policyholders are often broader in scope than most other companies or agencies can offer. Many are routine and offered as a standard part of Liberty's work. A few are Liberty exclusives. All are ready for "trouble shooting" – to crack dangerous or money-wasting problems that any policyholder may have. Some of these include:

A full-time staff of construction engineers to study jobs before work begins, provide safety recommendations and help solve problems in such fields as materials handling, falsework design, soil testing and structural safety.

Two rehabilitation centers to rebuild the self-respect of seriously injured workers and to speed their return to work.

These Liberty "extras," and the others shown on this page, all work to give you the best possible protection in depth. They are all available to any policyholder – large or small – who needs them. All of them can work with you to lower insurance costs.

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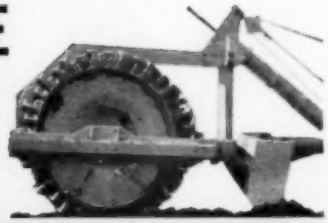
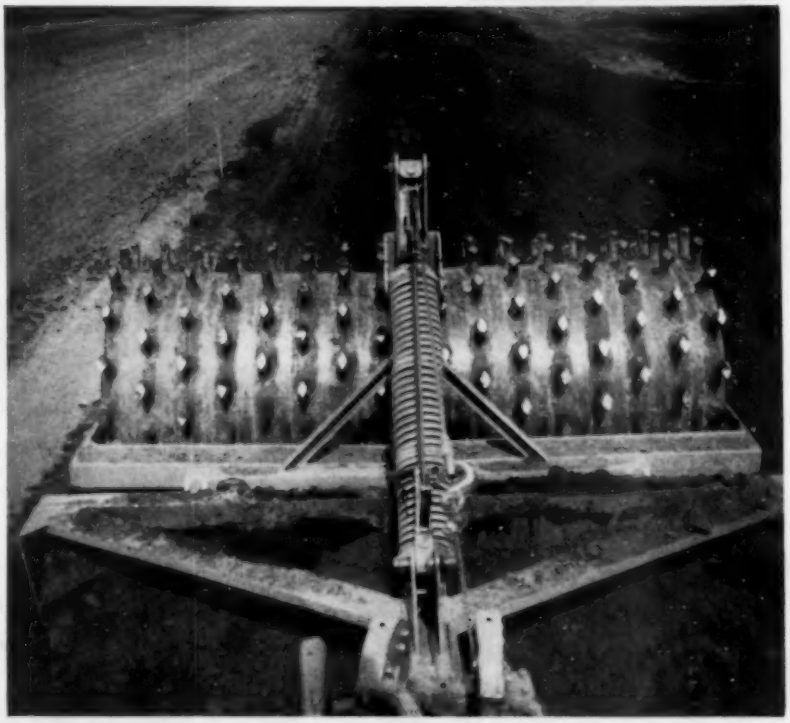
LAST YEAR HE WOULDN'T OWN ONE —THIS YEAR HE BOUGHT TWO!





The BROS Leveling Tamping Roller* is such an uncomplicated piece of equipment that last year even big grading contractors like Alley Construction Co., of Faribault, Minn. couldn't quite visualize its real value on earthfill work.

But this year, Lloyd Parker, Alley's superintendent on the grading job for nearly a million yards at Wold-Chamberlain Airport in the Twin Cities, put a BROS G2 Roller-Level Blade combination on the job —the results were so good that he purchased a second unit the *very next day!*

You can easily see why: The Leveling Roller makes subgrade rolling a productive item because it produces uniform, proper densities faster than conventional tamping rollers can. The blade puts the materials into the voids, building a smooth, level course, permitting equal compaction pressure over the full width of the drum. Because the course is smooth and compaction is fast, scrapers can haul and spread at faster speeds, earning you greater profits.

The Leveling Blade has 14" vertical adjustment which is controlled from the operator's seat by either hydraulic or cable control. The Leveling Roller is available in rolling capacities from 15,160 lbs. to 44,700 lbs. when roller drum is filled with wet sand.

*Patent Pending

Level Blade Attachments for your present BROS M2 and G2 Series Tamping Rollers are also available. M2 Blade Specifications: 112" width; 24" height; and ½" x 6" double bevel reversible high carbon steel cutting edge. G2 Blade Specifications: 141" width; 31" height; ⅝" x 8" square edge reversible high carbon steel cutting edge.

Get complete information on this new profit-making equipment from your nearest BROS Dealer or write us. World-wide sales and service.

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Write today for the full report on the Ohio tests and for complete new literature describing the new BROS SP-730 pneumatic roller. It's free of cost or obligation!

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ROLL-O-PACTOR

BITUMINOUS CIRCULATOR

VIBRA-PACTOR

9-TON SELF-PROPELLED ROLLER

9 AND 13-TON ROLLERS

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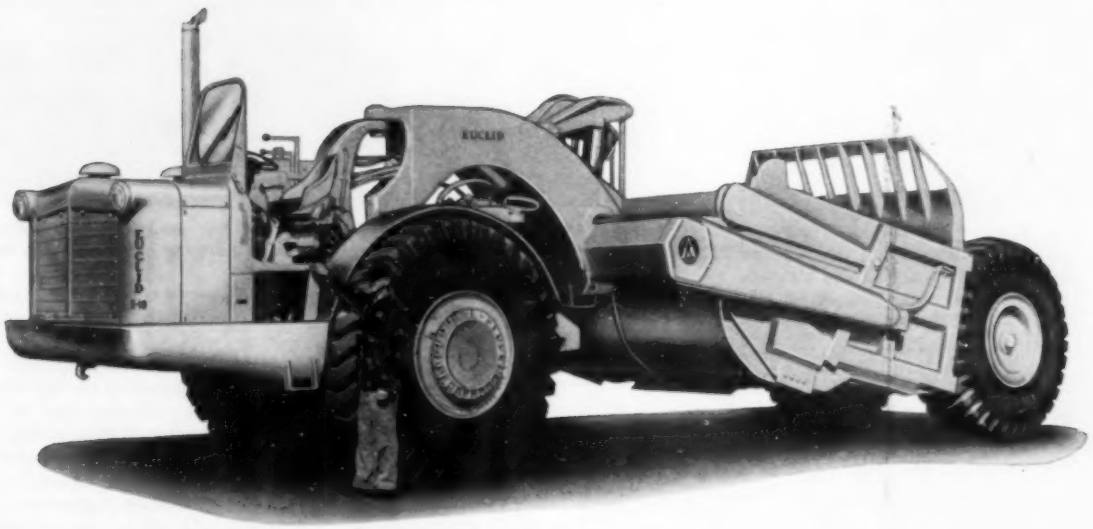
Now..."Euc" S-18 Scraper has struck capacity of 21 yds.



You get even more productive capacity in the new S-18... here are some of the reasons why:

- capacity increased from 18 to 21 cu. yds. struck... carries up to 30 yds. heaped
- more horsepower... 325 h.p. improves power-to-weight ratio
- 4-speed Torqmatic with converter lock-up... maximum power and fuel economy on grades and high speed hauls
- greater structural strength... designed for push-loading by the biggest tractors

See your Euclid dealer for complete data on the improved S-18... he'll be glad to explain the production advantages of this new scraper.

EUCLID Division of General Motors, Cleveland 17, Ohio

Hydraulic lever action provides fast, independent control of all scraper operations... eliminates cable "headaches"... permits controlled spreading of the load.

Torqmatic Drive pays off in faster cycle time and better production. There's no clutching or loss of momentum when changing to any of the 4-forward speeds. Converter lock-up provides direct drive for grades and long hauls.

GM GENERAL MOTORS EUCLID

EUCLID EQUIPMENT

FOR MOVING EARTH, ROCK, COAL AND ORE

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● By keeping the subbase material dry until it reached this point, screening efficiency to the ultimate was realized. Sprinkling done just prior to and during the laying out.

● Superaccurate placement of subbase material was assured by spreading the material in predetermined volumetric windrows, controlled by the latest in spreader boxes.

● R. E. Kasler of contracting firm on job with J. R. Beadles, general superintendent and Jerry Kasler, chief engineer.

TWIN LOADERS

(Continued from page 85)

ready to operate in May. It was not babied through preliminary test runs. The equipment was thrown into full-scale production the first shift, and has remained in that status since.

● *Fast-Moving Operation.* The operation is slowly drawing ahead of even the ambitious schedule Fredericksen & Kasler planned for it. Scraper loading is being handled by 5 Euclid SS-18's with Cummins 330 engines. Double pusher loading assistance is furnished by two D8's and a D8 Cat. The loader setup is one corner of the property, so hauls reach a maximum distance of slightly over 2,000 ft. The loads are bottom-dumped over grizzly bars into the feed hopper, whose manual gates have been removed. The dry material, averaging less than 1 percent moisture, is moved without clogging by a Kolman pair of feeder-trap combinations with built-in reciprocating plate feeders, which place the material on the loader belts.

High-Speed, fully loaded belts dump the material to the oversize screen decks at the end of each unit. By using slotted rather than square screen openings, the percentage of pit-run oversize has been reduced to about 4 percent. This fraction rolls off behind a retaining wall, where it can either be stockpiled by a push-pull type dozer Cat, or routed through a triple-roll crusher, which is arranged in closed circuit with the screen decks.

Since portions of the pit are sure to run too heavy in fines, this crushed rock fraction makes valuable blending material to bring sizes easily into specification limits when those conditions govern. Most of the oversize material produced so far is stockpiled.

Through material from the screens drops to 35-ton surge bins.

(Continued on page 122)

● Water for earth and subbase was pumped a maximum of 29 miles and lifted 800 ft., starting with this electric powered 300-hp pump station on the Mujave River bottom. Line is 8 in.; delivery 800 gpm at far end.

Loose Leaf, Completely Revised—

AGC's SAFETY MANUAL

THE FIFTH revised edition of the Manual of Accident Prevention in Construction, official safety manual of The Associated General Contractors of America, was published July 1. This edition, considerably expanded from the fourth edition issued in 1952, includes many substantial revisions and additions necessary because of developments in the past six years which have had a major effect on construction technology.

In announcing the revised manual, AGC Executive Director James D. Marshall said: "It is the result of studies and recommendations from experts in each field of construction. I recommend it highly to contractors as a means of reducing suffering and hardships caused by accidents and thereby building employee morale, increasing efficiency, lowering construction costs, and avoiding unnecessary governmental regulations. Only through a concerted effort can the construction industry reduce its rate of accidents."

"The AGC, in its drive to prevent accidents," said Marshall, "is getting more of its members each year to participate in the association's national safety program, by recording and studying accidents and engaging in accident prevention programs of education for supervisors and workmen. The majority of AGC members now participate in this program."

● For the first time, the new revised edition has been printed in loose-leaf form to permit frequent additions and changes in the future.

The introduction notes that if one half of all construction accidents could have been prevented by common sense, practical means, as has been proved possible; then sizable savings could have been effected in addition to the benefits deriving from avoidance of suffering, improved working conditions, and conserved manpower.

Accident prevention in construction, the introduction states, notes the AGC, is largely a matter of education, vigilance and cooperation. Hard and fast rules, in themselves, will not insure safety on the job.

(Continued on page 94)

One man can do it in 2 minutes with a LaCrosse TILT-TRAILER

Just tilt . . . load . . . and your equipment is ready to roll to your next job *in minutes*, with a LaCrosse Tilt-Trailer. There's an economical size and type for every hauling need — from *6 to 22-ton capacity* — with hydraulic "cushioning cylinders" standard on most models. Furthermore, when you buy a LaCrosse Tilt-Trailer, you get the same *rugged*, high-quality construction that goes into all LaCrosse low-beds — plus a *full-year factory warranty*, to protect your investment.

4 types . . . 6 to 22-ton capacity

Type LTA-4 — 6 or 8-ton capacity. 6½' x 14' platform with oscillating tandem axle and hinged drawbar.

Type TSA-2 — 8 or 10-ton capacity. 8' x 17' platform with single H-beam axle and adjustable drawbar.

Type DTTA — 13, 16 and 20-ton capacity. 8' x 18'5" platform with tandem axle and adjustable drawbar.

Type GTTA — 14, 18 and 22-ton capacity. 8' x 21'-2¾" platform with "walking-beam" tandem axle, patented 1-piece gooseneck.

LC-51

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Tell me more about LaCrosse Trailers (..... ton capacity)

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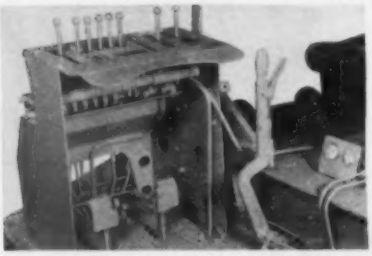
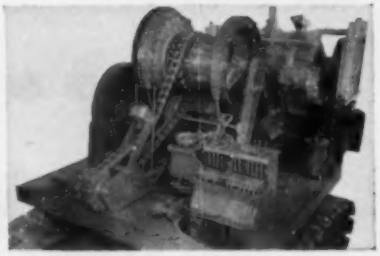
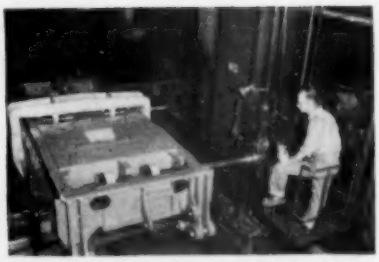
Six reasons why Link-Belt Speeder . . .



1. **SPLIT-SECOND FINGERTIP CONTROL** — Exclusive Speed-o-Matic power hydraulic controls put a K model through its paces at a flick of an operator's wrist . . . minimize fatigue . . . encourage high production throughout the shift.



2. **BONUS USABLE HORSEPOWER** — The extra strength built into load-carrying components permits K models to take full advantage of the engine's available horsepower and still remain well within engine manufacturers' recommended speeds.



3. **PRECISION ALIGNMENT TO CUT MAINTENANCE** — Close-tolerance machining, including jig line boring (above), means closer fits . . . less chance for eventual misalignment . . . no need for shims . . . better parts interchangeability.

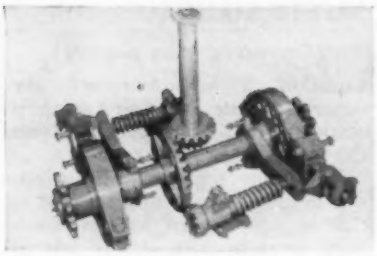
King-size K models

Here's how the 1¾-yard K-370 Series is tailored to today's economy . . . why it's a better buy than any 1½-yard shovel-crane . . . more practical to use than many 2-yard rigs

In comparison with 1½-yard machines, the 1¾-yard K-370 offers much more than just a 16% advantage in bucket capacity. It's fast, easier handling . . . exceptionally maneuverable and easy to transport. It boasts the top usable horsepower in its class . . . even outrates some 2-yard rigs.

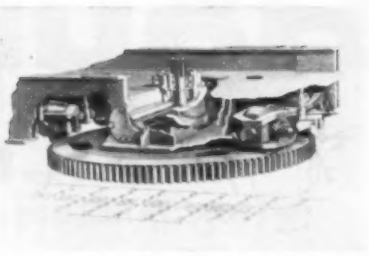
For the complete story, see your distributor or write for the new 20-page catalog, No. 2727.

LINK-BELT SPEEDER CORP., CEDAR RAPIDS, IA.



4. EXCEPTIONAL ON-THE-JOB MANEUVERABILITY —Traction mechanism features hydraulic power steer. This, plus high speed power shifting, makes K models great for work in tight quarters. No time wasted to manually engage jaw clutches.

5. EASY JOB-TO-JOB TRANSPORTABILITY —Any K model can be readied for lowboy or rail car transport in short order. Crawler side frames, counterweight and attachments can be removed to meet weight or width restrictions.



6. NO BINDING STRESSES ON CENTERPIN OR ROLLERS—Exclusive centerpin trunnion and oscillating conical roller design eliminates concentrated centerpin loadings . . . prevents shearing or bending . . . minimizes wear.

deliver bonus output

And here's why the 3-yard K-608 series outmaneuvers smaller rigs . . . often outproduces bigger machines

The K-608 has created real excitement wherever it has been used. It's so fast, so easy to handle, so powerful!

And no wonder—with Speed-o-Matic controls, power shift, power steer and many other features, the K-608 wheels through cycles at a speed you'd expect only from smaller rigs. The K-608 features an engine-torque converter and tailshaft output governor combination as standard equipment. The result—ability of engine power to adapt to load requirements . . . no chance for engine stalls.

For all the facts, see your distributor or write for the new 20-page catalog, No. 2710.

14;765

LINK-BELT SPEEDER

It's time to compare . . . with a Link-Belt Speeder

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TRAILER
FOR TRACTORS

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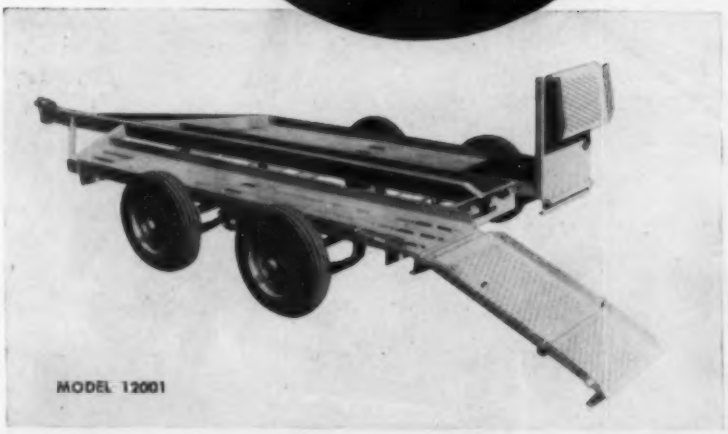

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SAFETY MANUAL

(Continued from page 91)

Constant, careful attention by the superintendent and foreman is needed along with cooperation from the workmen.

The same sequence of sections was followed in the new manual as that utilized in previous editions. Some sections with closely related subject matter were combined. The entire manual was reviewed by experts.

The sections on Explosives, Concrete Construction, Scaffolding, Power Tools, and Marine Equipment were enlarged and brought up-to-date. A section on Powder Actuated Tools was added. The section dealing with Highway Construction was greatly enlarged in scope, due to increased emphasis on this field of construction, with resultant large numbers of new contractors doing this type of work and increased public exposure to construction operations.

Numerous illustrations, tables and charts were added, including many detail sheets, furnished by the National Safety Council, which supply practical designs for job safety measures and devices.

The new edition was compiled and edited by D. A. Buzzel, the AGC Accident Prevention Department and with the cooperation and assistance of many individuals and corporations. An AGC Advisory Committee, headed by Ancle C. Tester of Washington, D.C., reviewed all revisions. Manuals cost $3.25 each, plus postage; send request to Associated General Contractors of America, 20th and E. Streets, N.W., Washington 6, D.C.

Soil-Cement Awards Reach Record High

Soil-cement paving awards through midyear of 1958, reached an all-time six-months high, surpassing those of the same period in 1957 by more than 8 million square yards, according to a report from the Portland Cement Association.

More than 22,310,000 sq. yd. of soil-cement paving was awarded through July 11 of this year, as contrasted with 14,280,000 sq. yd. in the first half of 1957. The 1958 awards were nearly double the 11,860,000 sq. yd. reported for the first half of 1955—just three years ago.

Awards for airports and miscellaneous paving, such as parking areas, were more than double the amount awarded during the first six months of 1957.

How to Figure Depreciation Costs for Construction Equipment

The various methods of depreciating the capital value of your machinery are discussed and compared, and an example carried out for each.

By R. L. Peurifoy

Professor of Construction Engineering, Texas A & M College

Is DEPRECIATION a major item of cost? A man purchased a 1955 model automobile at a cost of $4,700. When he disposed of this automobile in 1957, after driving it 20,000 miles in two years, he was allowed $2,000 as a trade-in on a new automobile, which resulted in a loss due to depreciation only equal to $2,700. This represented an average cost of 13.5c per mile.

Several years ago a contractor purchased construction equipment, which cost approximately $200,000. He promptly put it to work, and was fortunate in keeping it operating almost continuously during the first year. After deducting all operating costs, but no cost for depreciation of the equipment, from his gross income, he had a substantial balance in his bank account, which he considered to be profit. His books indicated an apparent profit of approximately $75,000. Later, when he learned that he must deduct from the apparent profit the cost of depreciation, he was less enthusiastic, but wiser in the knowledge of business.

If this equipment had an average life of five years, and was depreciated by the straight-line method, the cost of depreciation would be $200,000 $\div$ 5 = $40,000 for the year. When this amount was deducted from the apparent profit of $75,000, the net profit was $35,000.

Yes, depreciation is a major item of cost for contractors who own and use substantial quantities of equipment in their operations.

What is Depreciation? Depreciation is a loss in value of equipment resulting from its wearing out as it is used, or resulting from improvements in newer equipment which make the older unit less desirable. A new-type power shovel might be developed which can excavate earth at one-half the cost when using existing units. If a contractor is to compete with other contractors on a cost basis, he must replace his current shovels with the newer types, even though his current shovels are in good physical condition. The accompanying loss in value of the older equipment is the result of obsolesence.

Depreciation of equipment is a real, but seldom accurately known cost, which is recognized as such by the Internal Revenue Service when determining profit or loss resulting from the use of equipment. If a unit of equipment is purchased, used, and finally disposed of, no profit is realized from its use until the sum of all operating costs plus the amount paid for it less any net salvage value is deducted from the gross profit earned by it.

● *Cost Basis.* The cost of equipment should include the total of all costs paid by the purchaser in order to place the equipment in service. These include the following:

1. Cost f.o.b. the factory
2. Freight from the factory to the purchaser
3. Cost of unloading, assembling, etc.

● *Salvage Value.* When equipment is disposed of it may yield some proceeds to the seller, through direct sale to another person, a trade-in allowance on the purchase of other equipment, or as scrap. If there are any costs in connection with the disposition of the equipment, such costs should be deducted from the gross proceeds in order to obtain the net salvage value.

The cost of depreciation is equal to the total cost less the net salvage value.

Professor Peurifoy is the author of two books, ESTIMATING CONSTRUCTION COSTS AND CONSTRUCTION PLANNING, EQUIPMENT, AND METHODS, *published by McGraw-Hill Book Co.*

Table 1. Cost of Depreciation Using the Straight-Line Method

End of year	Annual cost of depreciation	Book value
0	$0	$22,000
1	4,000	18,000
2	4,000	14,000
3	4,000	10,000
4	4,000	6,000
5	4,000	2,000

● *Methods of Determining Cost of Depreciation.* It is well known that equipment experiences its greatest depreciation during the first year of use, and that for succeeding years the depreciation per year will diminish with each year. It is desirable to adopt a method of determining the cost of depreciation that is realistic, one which will give a value at any age as nearly equal to the true values as practical. If this is not done, the inventory value of equipment will not reflect its true value. Likewise, the net profits for the years involved will not be correct, which may materially affect the amounts of Federal income taxes paid.

While any reasonable method, which can be adequately justified, will be accepted by the Internal Revenue System, the following methods have been approved, and are used:

1. Straight-line method
2. Declining-balance method
3. Sum-of-the-years-digits method
4. Sinking-fund method

Each method will be described and illustrated.

The book value of equipment at the end of any given year, as used hereafter, is the remaining value after the cumulative cost of depreciation for all prior years is deducted from the initial, total cost. This value is the result of bookkeeping operations, which may or may not represent the real value of the equipment.

● *Straight-line Method.* This method is based on the assumption that depreciation will occur at a uniform rate for each unit of time, usually a year, during the useful life of the equipment. This method will give costs which are too low during the early years and too high during the latter years of life of the equipment. However, because of its simplicity it has been used frequently. If equipment is retained to the end of its useful life, the ultimate results produced by this method are satisfactory.

Table 1 gives the cost of depreciation and the book value for each year.

● *Declining-Balance Method.* If this method is adopted, the largest cost of depreciation will occur during the first year of use, and smaller amounts will occur for succeeding years. If the useful life is assumed to be five years, the average depreciation will be 20 percent per year. This rate is doubled to give 40 percent. The cost of depreciation during the first year of use will be 40 percent of the initial total cost, with salvage value neglected. The cost during the second year will be 40 percent of the value at the beginning of the second year, which is the book value at the end of the first year.

This procedure is applied for each year of life until the book value declines to a reasonable salvage value, after which no further depreciation may be taken.

Table 2. Cost of Depreciation Using the Declining-Balance Method

End of year	Percent depreciation	Annual cost of depreciation	Book value
0	0	$0	$22,000
1	40	8,800	13,200
2	40	5,280	7,920
3	40	3,168	4,752
4	40	1,901	2,851
5	40	1,140*	1,711
5*		851*	2,000

* If the value of the equipment cannot be depreciated below $2,000 the lower value, namely $851, will apply; otherwise the $1,140 will apply.

The following example illustrates how this method operates, and the results produced from its use:

Total cost of equipment ..... = $22,000
Less estimated salvage value ..... = 2,000
Total cost of depreciation ..... = $20,000
Estimated useful life, 5 years
Annual cost of depreciation, $20,000 ÷ 5 yr ..... = $ 4,000

Note that the estimated salvage value is not deducted from the initial total cost when calculating depreciation by this method.

The following example illustrates how this method operates, and the results obtained from its use:

Total cost of equipment, $22,000
Estimated salvage value, $2,000
Estimated useful life, 5 yr
Average annual rate of depreciation, 20%
Depreciation rate used with this method, 2 x 20 = 40%
Cost of depreciation first year, 40% of $22,000 = $8,800
Book value at end of first year, $22,000 - $8,800 = 13,200
Cost of depreciation second year, 40% of $13,200 = 5,280
Book value at end of second year, $13,200 - $5,280 = 7,920

Table 2 gives the cost of depre-

(Continued on page 100)

Table 3. Cost of Depreciation Using Sum-of The-Year's-Digits Method

End of year	Depreciation ratio	Cost less salvage value	Annual cost of depreciation	Book value
0	0	$20,000	$ 0	$22,000
1	5/15	20,000	6,667	15,333
2	4/15	20,000	5,333	10,000
3	3/15	20,000	4,000	6,000
4	2/15	20,000	2,667	3,333
5	1/15	20,000	1,333	2,000

Loading C Rear-Dump with 10 yards of rock takes about 2 minutes. Pit alongside busy tracks is just big enough to allow one extra haul unit to be crammed into it.

Only one-way traffic is possible as machines haul over single-track railroad right-of-way. Tournapulls average 10 to 12 mph on 3200-ft. cycles.

MOVING ROCK

for Trans-Canada Highway System

To move traffic faster and with greater safety through Canada's narrow Fraser River Canyon, British Columbia's Highway Department undertook relocation of 4½ miles of rocky, mountainous road.

The new route, about 20 miles north of Hope, is being built to specifications for the Trans-Canada Highway System . . . bypassing many curves . . . and eliminating a number of narrow "one-way" sections in the old road.

Highway Construction Company, Limited, Vancouver, is using *three* 22-ton C Tournapull® Rear-Dumps to move the toughest half of the 700,000 cubic yards of rock involved in the job.

Hauls over tracks, rock fill

Tournapulls hauled rock spoil 1600 feet: about 400 feet along planked railroad tracks . . . up a short 7% grade to the new roadway . . . then over level shot-rock fill to the dump. Train traffic (about 1 per hour) interrupted work. Loads in highly fissured granite, seamed with quartz, averaged 10 yards according to cross-sections taken by General Project Manager Ken Romano. (Contractor did not heap Rear-Dumps to their capacity height to avoid spilling rock on busy RR tracks.)

Tournapull haulers completed 3200-foot cycles in an average of 5.35 minutes. Each machine moved about 9½ loads hourly . . . 57 loads in 6 hours . . . in spite of rail-traffic delays.

Maneuver better than other machines

Men on this job say Tournapulls maneuver better than other machines.

"Many of our jobs couldn't be worked with anything but a LeTourneau-Westinghouse Rear-Dump," says K. J. Romano. "Their high dependability means consistently high production for us. Their maneuverability in tight quarters and ability to get through mud makes them perfect." On its entire series of Fraser River Canyon contracts, Highway Construction Company used all its own fleet of 9 C Rear-Dumps . . . rented 2 additional "C's" for the busiest months.

Work in 3-4 ft. of mud

Before coming here, machines helped build 15 miles of logging railroad — cutting through rock, swamp and muskeg — on the north end of Vancouver Island. Here, machines worked in mud 3 or 4 feet deep most of the time, say company officials. During their better-than-a-year stint at this location, machines recorded 100% availability. Rear-Dumps later traveled from Vancouver Island to the Fraser River Canyon work site under their own power.

If you have tough rock work in your schedule, you'll want to know more about rugged Tournapull Rear-Dumps. Call or write for details.

K. J. Romano of Highway Construction Company also uses two Adams* graders on this relocation section of the Trans-Canadian Highway #1. His 550 and 660 Adams graders slope banks (1½:1 grade) . . . move rock and crushed gravel in a series of scattered jobs. In winter, he uses his graders to plow snow.

"We bought Adams graders because we believed them to be the best graders available," comments Ken Romano, "and (after using them) we still believe it."

P. J. Friesen, Operator on the "550", likes Adams optional creeper gears. "Creepers are perfect for work in rock," he says. "They help me do a better backsloping job, save the machine, too. Controls are fast and accurate. You can't beat these graders for finish work."

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Maneuverability and ease of handling pay off in the tight spots. On the Division Street project in Pawtucket, R. I., space was at a premium. Spotting, dumping, or traveling over busy city streets, the combination of Mack maneuverability, and the positive traction provided by Mack's exclusive Balanced Bogie with Power Divider, materially speeded up work cycles on this project.

"We finished off the Interstate Highway job in record time, thanks to our Macks." Campanella and Cardi set new records for a job of this type, which included relocating the channel of the Big River, excavating for bridge construction, and hauling in heavy materials.

rushed to completion

"As the trucks go . . . so goes the job." That's what Campanella and Cardi Construction Co. of Providence report. They credit their 55 Mack trucks with maintaining their reputation for record-time contract completion.

They'll tell you that with Macks pacing the job, the hauling-dumping cycle proceeds on-the-double . . . shovels operate at full capacity . . . down time is held to a minimum.

Husky Mack dumpers take the day-in, day-out beatings delivered by the tons of rock and earth dropped from the shovels . . . and keep coming back for more.

Campanella and Cardi will tell you that Mack dependability speeds their entire operation. So will the Mack user nearest you. Get his name from your Mack branch or distributor. Mack Trucks, Inc., Plainfield, New Jersey. In Canada: Mack Trucks of Canada, Ltd.

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DEPRECIATION COSTS

(Continued from page 96)

ciation and the book value for each year.

● *Sum-of-the-Years-Digits Method.* Under this method of determining the cost of depreciation, all of the digits representing each year of the estimated useful life of the equipment are totaled. For an estimated life of 5 years, the sum of the digits will be $1 + 2 + 3 + 4 + 5 = 15$. Deduct the estimated salvage value from the total cost of the equipment. For the first year, the cost of depreciation will be 5/15 of the total cost less the estimated salvage value. For the second year, the cost of depreciation will be 4/15 of the total cost less the estimated salvage value. Continue this process each year through the fifth year.

Table 3 gives the cost of depreciation and the book value for each year, using the equipment from the previous example.

Table 4. Cost of Depreciation Using the Sinking-fund Method

End of year	End of year deposit	Balance in sinking fund	Annual cost of depreciation	Book value
0	$ 0	$ 0	$ 0	$22,000
1	3,548	3,548	3,548	18,452
2	3,548	7,309	3,761	14,691
3	3,548	11,297	3,988	10,703
4	3,548	15,522	4,225	6,478
5	3,548	20,000	4,478	2,000

● *Sinking-Fund Method.* Under this method of determining the cost of depreciation it is assumed that a special account, designated as a sinking fund, is created, into which an appropriate uniform amount of money is deposited at the end of each year throughout the useful life of the equipment for the purpose of providing enough money to purchase a new unit of equipment. The estimated salvage value of the used equipment plus the amount in the sinking fund should be sufficient to purchase a new unit. However, if the cost of a new unit increases during this period of time, the amount in the sinking fund plus the salvage value will not be sufficient to purchase the new unit, and additional money will be required.

● It is assumed that money deposited into the sinking fund will earn interest compounded annually at an appropriate rate, usually at a rate corresponding with the interest rate paid by the contractor for borrowed money. In actual practice the money is used in conducting the business, instead of being deposited into a sinking fund.

The formula which gives the amount of year end deposits is as follows:

$$R = S\left[\frac{i}{(1+i)^n - 1}\right] \qquad (1)$$

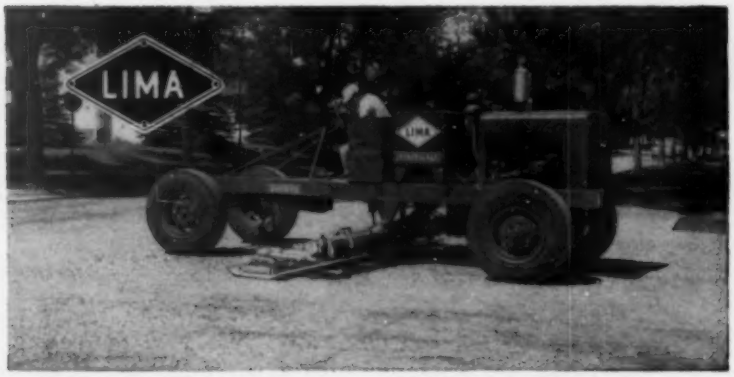
Where R = the required deposit each year

S = the amount needed in the fund at the end of the period of years

i = the interest rate, expressed decimally

n = number of years of useful life for the equipment

While the formula appears complicated, tables are readily available



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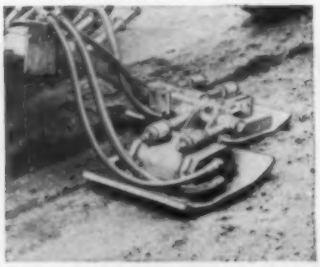

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which gives the values of

$$\left[\frac{i}{(1+i)^n-1}\right]$$

for any reasonable value of i and n.

As deposits and earned interest are credited to this fund it will increase in value, with the value at the end of any given year being determined from the formula

$$S = R\left[\frac{(1+i)^n-1}{i}\right] \qquad (2)$$

Where all values are as previously given except n, which is the number of deposits made at the given time.

The amount in the sinking fund plus the book value of the equipment will always equal the total cost of the equipment. The cost of depreciation during any given year will equal the increase in the sinking fund during that year.

The operation of the method is illustrated by the following example:

Total cost of equipment	= $22,000
Less estimated salvage value	= 2,000
Total cost of depreciation	= $20,000

Estimated useful life, 5 years

Assume an interest rate of 6% per year

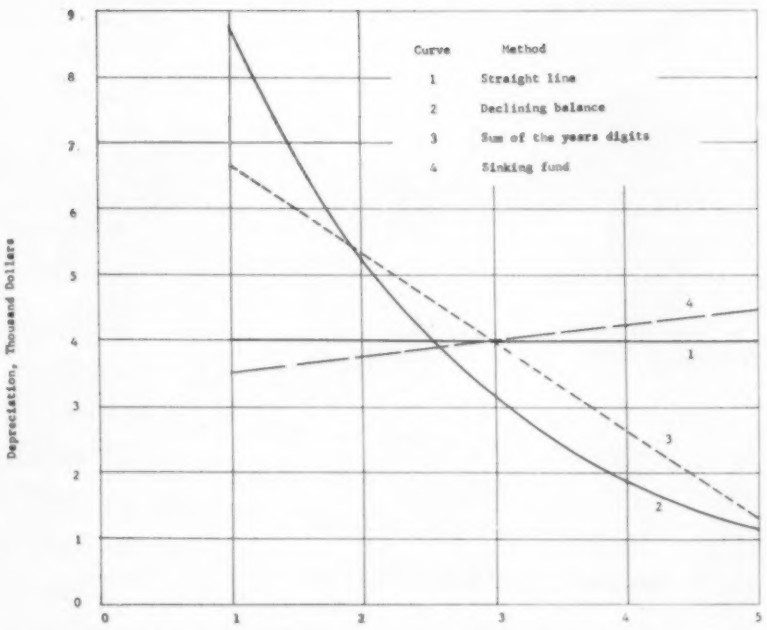

Fig. 1. Annual Cost of Depreciation by Various Methods

At the end of five years the sinking fund must have a balance of $20,000.

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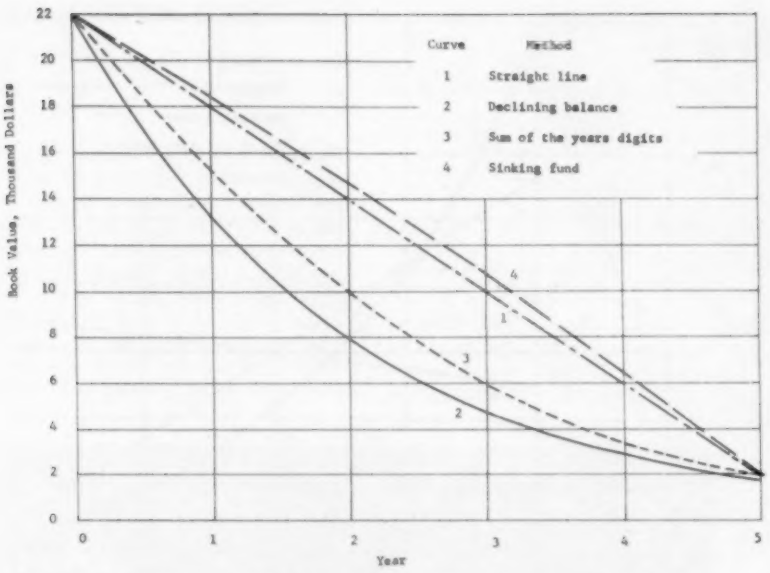

Fig. 2. Comparison of the Cost of Depreciation by Various Methods

From formula (1) the deposit at the end of each year, including the fifth year, will be

$R = \$20{,}000 \times 0.1774 = \$3{,}548$

The amount in the sinking fund at the end of the first and second years will be

2nd year, $\$3{,}548 \times 2.06 = \$7{,}309$

1st year, $\$3{,}548 \times 1.00 = 3{,}548$

Difference ..... $= \$3{,}761$

This difference, amounting to $3,761, is equal to the cost of depreciation during the second year. Since the difference will be larger for each succeeding year, the depreciation per year will increase. Thus, this method gives the lowest depreciation during the first year and the highest during the last year of life of the equipment.

Table 4 gives the cost of depreciation and the book value for each year.

Figures 1 and 2 illustrate graphically the effects which the four methods have on the cost of depreciation. The height of the ordinate to a curve at the end of any given year in Fig 1, is the cost of depreciation during that year when using the particular method applicable to the curve. Curve 2 most nearly corresponds with the actual depreciation of equipment, with the other curves following in order 3, 1, 4.

The curves in Fig. 2 indicate the book value of equipment at the end of any given year for the particular method selected. Again curve 2 most nearly corresponds with the true book values.

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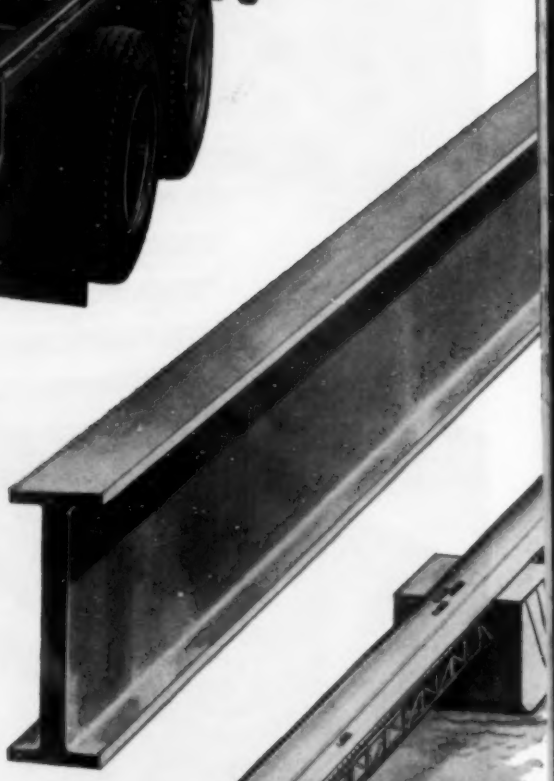

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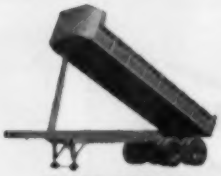

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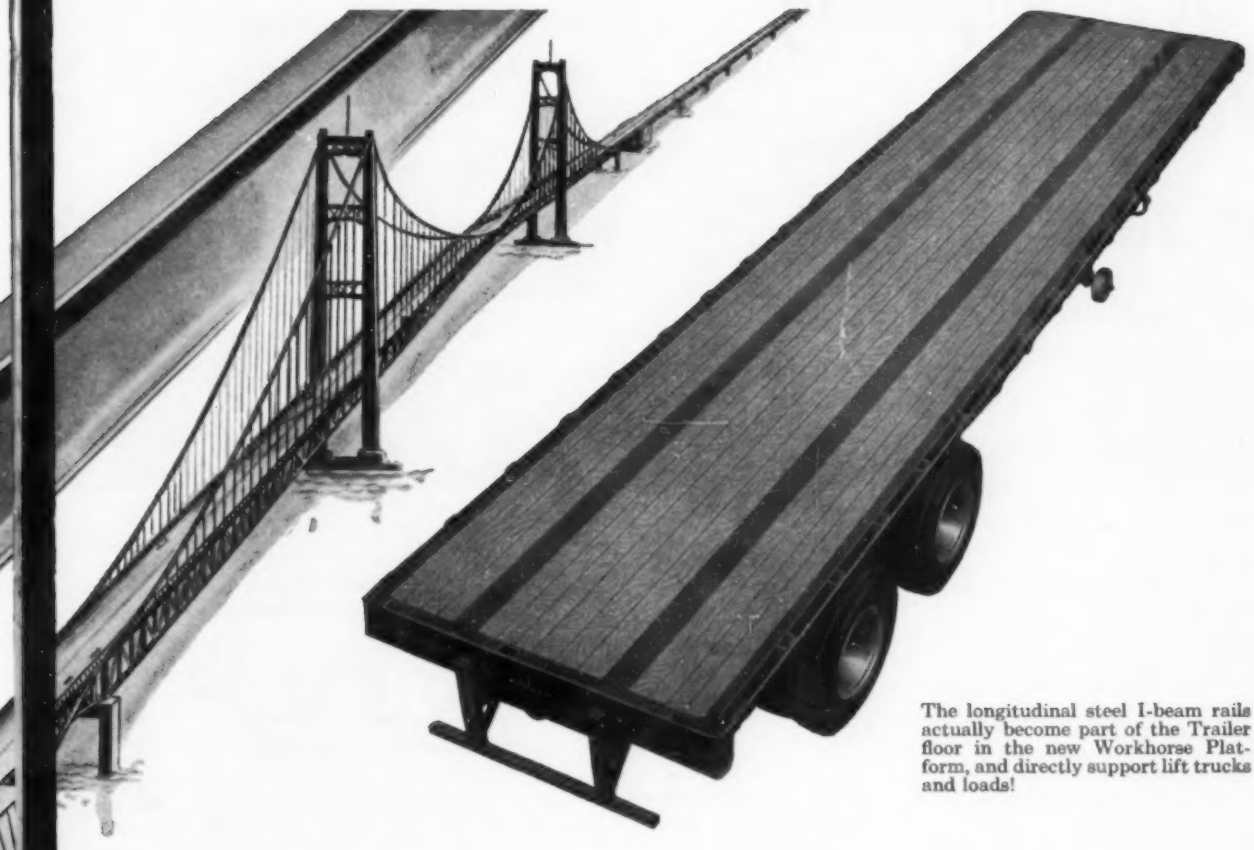
CARRYALLS

BULK CEMENT TANKS



The longitudinal steel I-beam rails actually become part of the Trailer floor in the new Workhorse Platform, and directly support lift trucks and loads!

The New Fruehauf Workhorse Platform Is Tough As A Bridge!

. . . yet saves up to 1,200 pounds in weight

The new Fruehauf Workhorse Platform is built for strength, lasting power, and big weight savings.

Its deep, deep 19½" I-beam channels directly support loads, lift trucks, and all the forces that tax and strain platform strength.

They do the job, and last, because they're extra deep, continuous, forged of the toughest low alloy, high-tensile steel.

Rugged, full-width I-beam crossmembers at 18" intervals increase rigidity and carrying capacity. Everything about the Workhorse is designed for top payloads and hard work.

Call your Fruehauf Branch while you're thinking of it now for a complete look at the toughest platform built!

Fruehauf Trailer Company, 10949 Harper Avenue, Detroit 32, Michigan.

FOR FORTY-FOUR YEARS MORE FRUEHAUF TRAILERS ON THE ROAD THAN ANY OTHER MAKE!

World's Largest Builder of Truck-Trailers

FRUEHAUF TRAILER COMPANY

10949 Harper Avenue • Detroit 32, Mich.

√ SEND ILLUSTRATED LITERATURE GIVING MORE FACTS ABOUT THE NEW FRUEHAUF WORKHORSE PLATFORM AT ONCE.

NAME_____

COMPANY_____

ADDRESS_____

CITY_____ STATE_____

. . . for more details circle 265 on enclosed return postal card

"Beat anything we've had or seen"

say Caylor Bros.

Demonstration convinces contractor ...18-yd. Fullpaks® get nod over 25-yd. competition

Caylor Bros., Ottawa, Kansas have retired 3 older 14-yd. scrapers in favor of 3 new 18-yd. scrapers of modern design. New dirtmovers were purchased after studying current equipment. After narrowing the field to two makes, a competitive demonstration was arranged between a LeTourneau-Westinghouse 210 hp C Tournapull® with 18-yd. Fullpak scraper, and another-make 25-yd. scraper with 300 hp supercharged engine.

Fayne Caylor (who had never been on a "C" before) operated the Fullpak during test, against a trained demonstrator on the bigger rig. According to contractor's records, "C" loaded — heaped to overflowing — in 30 to 35 seconds. The 300 hp pan took 1¼ to 1½ minutes in the same dirt. Payloads on the bigger unit averaged only 3.3 to 3.6 yds. larger. Haul speeds were comparable.

The brothers decided the few extra yards with twice the loading time were not worth the extra "chips"... so they ordered 3 C Fullpaks.

Fast-loading bowl speeds dirtmoving

"That Fullpak bowl is the livest scraper bowl I've ever seen," reports Fayne Caylor. " 'C' has lots of power, hauls plenty of dirt, and moves it fast. We're mighty happy with 'em." Another brother and partner, C. A. Caylor, says, "We've worked the 'C's' in a lot of different types of soil, gumbo and all. The Fullpaks do a wonderful job. I like the way they load, and unload too. *They beat anything we've had or seen.*"

334,400-yd. job for Kansas Hwy. Comm.

On their first job, the 3 Fullpaks helped relocate an 8½-mile stretch of U.S. 83 at Rexford, Kansas. 334,400 yards of dirt were moved, with "C's" handling 75% of that figure.

Earthmoving was 90% complete — and well ahead of schedule — when job was visited. Fullpaks were cutting wet "badger dirt" (sandy loam with clay hardpan), and hauling straight-and-level on an average 5990′ cycle. In an average of 62 seconds and 75′, Tournapulls heaped loads estimated by Fayne Caylor at 15 to 17 pay-yards. Though haulroads were soggy, 3 "C's" made the 1.1-mile cycle in an average of 8 min., 23 sec.... three units hauled 20 payloads per 55-min. hr.

Almost 100% operating efficiency

Operator Ray Evans says, "This 'C' loads quick and easy, has lots better vision than (25-yd. competitor). I've worked over 400 hours and haven't been 'down' a total of 15 minutes." Marvin Marcotte adds, "These outfits operate very smooth, and are easy to control. I especially like the speed of electric controls, and also the automatic transmission."

For your bread-and-butter earthmoving, you'll find 18-yd. C Fullpaks move today's dirt at today's lowest-net-cost-per-yard. Call us for details and a demonstration.

CP-1612-DCJ-1

Out of the borrow with estimated 16 pay-yards, one of Caylor Bros.' C Tournapulls with Fullpak scrapers heads for the fill. 3 Fullpaks handled 75% of 334,400-yd. dirtmoving on relocation of U.S. 83, to eliminate 7 curves and bypass city of Rexford, Kansas.

... for more details circle 288 on enclosed return postal card

LETOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

New Products

Reader Service Numbers on Enclosed Postcard

Aluminum Trailer Loaded with 42 Ton Tractor

Aluminum Trailer

A new aluminum flatbed trailer weighing 7,400 lb. has been built by Williamsen Body & Equipment Co. Constructed of high-strength aircraft alloys, the new trailer can support with ease the combined weight of two D-8 caterpillar tractors, each tipping the scales at 21 tons.

Designed by Williamsen, in cooperation with Aluminum Company of America's development division, the new 40-ft. rig is stated to be able to transport 50,000 lb. of concentrated payload.

Williamsen Body and Equipment Co., Ogden, Utah, U.S.A.

For more details circle 101 on Enclosed Return Postal Card.

Vibratory Roller

The new VR-72-T high frequency vibrating roller, announced by Essick Manufacturing Co., has a 72-in. wide, 51-in. diameter roll. It has a 12 ft. 4-in. overall length, 7 ft. 5-in. overall width and 5 ft. 6-in. height. It is powered by a Model F-226 Continental engine producing 59 hp. at 1800 rpm. Its approximate net weight is 8,100 lb. The vibrating shaft rotates at 2320 rpm-constant. The pulling tractor is equivalent to D4 Caterpillar.

Essick Manufacturing Co., 1950 Santa Fe Ave., Los Angeles 21, Calif.

For more details circle 102 on Enclosed Return Postal Card.

Transverse Finisher

A new transverse finisher, offering a single lever adjustment for crown transitions, has been added to the paving package of Koehring. The one-man operated unit has two hydraulically raised oscillating screeds. Slabs from 10 to 30 ft. wide can be finished with standard adjustable widths as follows: 10 to 18 ft.; 18 to 26 ft.; and 22 to 30 ft. Three screed oscillation speeds—23.6, 34.2 and 56.4 strokes per minute—are provided. Screed stroke length is variable. The rear screed is located behind the rear wheels. Traction speeds available during the finishing operation are: 8, 11.8 and 19.5 ft. per minute. An additional speed of 81.5 ft. per minute is available when non-finishing movement is necessary.

Koehring Division, Koehring Co., 3026 West Concordia Ave., Milwaukee 16, Wis.

For more details circle 103 on Enclosed Return Postal Card.

Koehring Transverse Finisher

Essick VR-72-T High Frequency Vibrating Roller

BRAND NEW Barricade Flash!

the Big Beam TRANSISTA FLASH

- **Transistor type, heavy duty for long, dependable life.**
- **No moving parts to get out of order.**
- **Two-directional head or 360° dome type Fresnel.**
- **Electronic flashing mechanism weatherproofed. Telescoping top and rubber gasket make battery case completely weatherproof.**
- **Acid-proof plastic liners prevent interior case corrosion.**

TRANSISTA FLASH produces approximately 2000 hours of continuous flashing from two standard 6-volt batteries, available anywhere. Provided with a concealed, tamperproof switch operated from outside of case. Equipped with bracket for attaching to barricade. Lens or Fresnel supplied in either amber or red plastic—specify color. Flash frequency is approximately 72 times per minute. Lamp is finished in yellow baked enamel.

Model 410T

Model 418T—with dome type Fresnel.

Model 417T—7 inch head. Otherwise, same as Model 410T.

No. 433 Barricade—All metal, strong, stable on any surface. Has angle iron construction, closed ends.

Big Beam—makers of explosion-proof lamps, emergency lights, hand lamps and flares. 8393

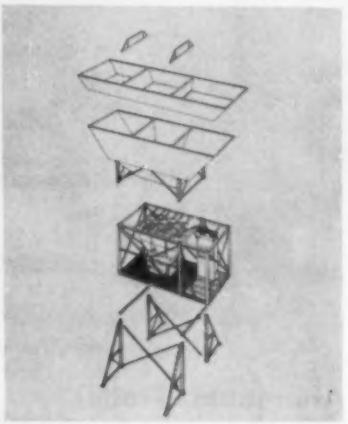
U-C-LITE MFG. CO. 1023 West Hubbard Street Chicago 22, Illinois

Export Department: 201 N. Wells St., Chicago 6, Ill. Cable Address: ENOTS
In Canada: Bernard Marks & Co. Ltd., 70 Claremont St., Toronto 3, Ontario

. . . for more details circle 314 on enclosed return postal card

Aggregate Batch Plant

The "Automaster-A," an automatic aggregate batch plant with a production capacity of up to 229 batches per hour, is the latest product of C. S. Johnson Co. Quick erection and disassembly which are important feautres of the plant, are possible because the number of sections is kept to a minimum. Maximum erection lift, however, is only 9 tons. Batching and recording equipment remain intact during moves.



Section of "Automaster-A" Batch Plant

Bins are available in three or four compartment styles, both with 120 cu. yd. (180 tons at 3000 lb. per cu. yd.) heaped capacity. One 25-cu. ft. batcher for each material (200 lb scale) handles a 1½-cu. yd. paver batch. Plants are available with two sets of either three or four batchers for extreme high production.

C. S. Johnson Co., Champaign, Ill.

For more details circle 104 on Enclosed Return Postal Card.

Dustless Drilling System

A new dustless rock drilling system featuring "inhaling" air drills is stated to eliminate hole blowing, water nui-

Dustless Rock Drilling System with New Thor 390-DL-250 Automatic Push Feed System. Thor No. 250 Dust Extractor in Foreground

CONTRACTORS CUT COSTS WITH EIMCOS'

Move more earth at less cost with Eimco heavy-duty equipment

INDEPENDENT TRACK ASSEMBLY
Each track is powered and controlled separately — Tractor spin turns in it's own length, with one track in forward and the other in reverse.

UNIT ASSEMBLY
Each major tractor component is a separate assembly for easy maintenance or removal without disturbing other components.

INSTANT REVERSAL
No stopping, manual clutching or gear shifting to change directions — A pull on the track control levers immediately reverses the tractor.

FULL VISIBILITY
Up-front operators position eliminates all guess work in dozing, digging, pushing and loading operations.

Eimco heavy-duty earth moving machinery will permit lower bids on construction work.

Here are reports from a few jobs where Eimco equipment is being used:

1. Underground limestone quarry working an Eimco 105 on 2 levels to do all underground loading. — "Our maintenance parts and labor for the past 21 months have cost 2½ cents per ton."

2. Road contractors in the deep South — "We now have more than 17,000 hours on our 105 and have not had to open the transmission for any reason."

3. "We averaged better than 45 feet a day on our job mostly because of the 105's." — This letter from a tunnel contractor who is driving a large heading with two 105's working side by side.

4. Quarry contractor — "In a few days we should receive our third Eimco 105. These machines are gradually taking over all production and are replacing the boom shovel."

5. Railroad contractor — "Our 105 has replaced a 1½ yard boom shovel and a bulldozer we had used to move stone up to the shovel.

THE EIMCO CORPORATION • SALT LAKE CITY, UTAH
EXPORT OFFICE, 51-52 SOUTH STREET, NEW YORK, N. Y.
BRANCHES AND DEALERS IN PRINCIPAL CITIES THROUGHOUT THE WORLD

B - 346

. . . for more details circle 260 on enclosed return postal card

sance, and dust hazards by sucking rock chips and dust through a hollow steel into specially designed dust-extracting tanks. These dust extractors combine three inter-connected cylinders, two cyclone units with emptyable heavy duck chip sacks and one filter unit with cleanable, renewable filter liner. The systems are designed in three drill and extractor combinations—the Thor 390-DL-250 automatic push feed system, 75-DL-250 sinker system, and 15-DL-50 utility system—based on varying rock drilling and dust capacities.

Thor Power Tool Co., Prudential Plaza, Chicago 1, Ill.

For more details circle 105 on Enclosed Return Postal Card.

New Koehring Model 100 "Dumptor." Inset Shows Operator's Cab

New Koehring Dumptor

Incorporation of the no-turn shuttle hauling feature in a bigger capacity "Dumptor" unit has been announced by Koehring. The new Model 100 has a capacity of 100 yd or a 30,000-lb. payload.

Speeds up to 20 mph in either direction are stated to be possible because of a constant mesh transmission and torque converter drive. The "Dumptor" has two speed ranges controlled by hydraulic clutches. Loaded and in low range the maximum speed is 6¾ mph. A pivoting seat permits the operator to drive in either direction without lost time in turning the Dumptor around. Dual steering wheels, throttles and brake pedals are provided.

Both an instantaneous gravity and a controlled dump are possible with the model 100. A free swinging kick-out pan and a 65-degree dump angle are used to assure complete discharge when wet material is being hauled.

Koehring Division, Koehring Co., 3026 Concordia Ave., Milwaukee 16, Wis.

For more details circle 106 on Enclosed Return Postal Card.

Reflective Glass Beads

A new reflective glass bead, designated as UB68, for application to backgrounds of thruway signs, has been placed on the market by the Flex-O-Lite Manufacturing Corporation. An ultra bright bead in the medium index classification, it is stated to be particularly adapted for use on signs in the darker pigmented colors such as greens, blues and reds.

Designed for 'round-the-clock protection of motorists, the bead is said to assure impressive reflectivity under all weather conditions, and to offer maximum possible angularity up to the point of passing. Chemical stability and long life as well as ease of application, and a minimum of maintenance are claimed for the product.

Flex-O-Lite Manufacturing Corporation, 8301 Flex-O-Lite Drive, P.O. Box 3066 (Afton Br.) St. Louis 23, Mo.

For more details circle 107 on Enclosed Return Postal Card.

Color for Paved Surfaces

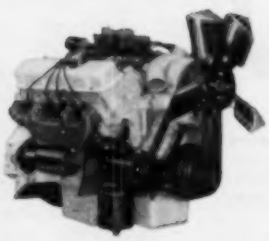
A plasticized mastic concentrate having a latex base has been developed for use on either bituminous or concrete surfaces. Known as "Decoratop", it is available in red, green, cement gray, or white. It is stated to be anti-skid and to offer high resistance to abrasion, water, weather, anti-freeze solutions, oils, greases and many chemicals.

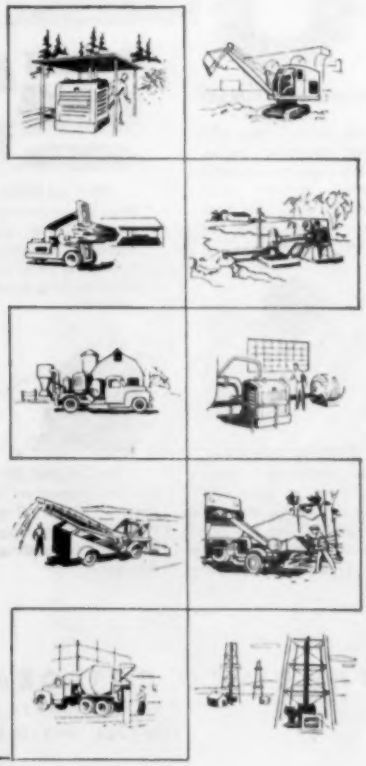
United Laboratories, Inc., 16801 Euclid Ave., Cleveland 12, Ohio.

For more details circle 108 on Enclosed Return Postal Card.

From 134 to 534 cubic inches...

there's a **FORD INDUSTRIAL ENGINE** to meet your every power need!





• Whether you farm . . . drill for oil . . . build highways . . . or manufacture, there's a Ford Industrial Engine that can make your operation even more efficient and more profitable.

Take Ford's new Super Heavy Duty V-8's. Built to handle the big jobs easier at less cost, they have new *fully machined* combustion chambers . . . new fuel induction systems . . . new lubrication systems . . . and provide more horsepower per pound of engine weight than ever before possible.

These are typical of the many engineering advances you'll find in all Ford Industrial Engines. If you're considering new power or repowering, it'll pay you to check Ford's full line of 4-, 6- and V-8 cylinder engines . . . including the Ford 220-cu. in. and 330-cu. in. Diesels. Most models are available as engine assemblies or power units, foot- or skid-mounted.

Ford INDUSTRIAL ENGINES AND POWER UNITS

YOUR JOB IS WELL-POWERED WHEN IT'S FORD-POWERED

Write for complete information: INDUSTRIAL ENGINE DEPARTMENT
FORD Division of FORD MOTOR COMPANY
P. O. BOX 598, DEARBORN, MICHIGAN

. . . for more details circle 263 on enclosed return postal card

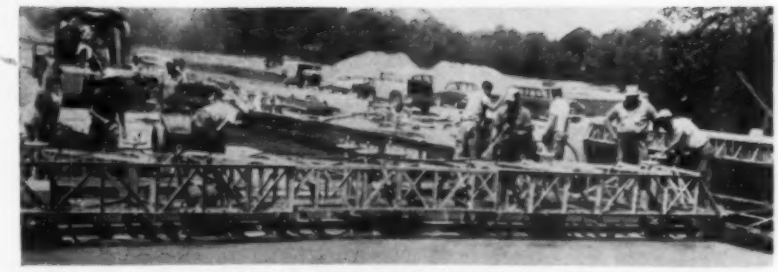
Bridge Deck Finisher

An entirely new type of concrete bridge deck finisher, stated to be lighter and easier to handle, has been put in production by Master Vibrator Co. It has a total weight of less than 3,000 lb., and is said to do a job on bridge decks equivalent to that done on roadways by highway finishers.

This new machine strikes off, vibrates, compacts and finishes concrete to specifications in one pass, providing a smooth, accurate finish. It is adjustable in lengths from 15 to 31 ft.

Master Vibrator Co., 1752 Stanley Ave., Dayton, Ohio.

For more details circle 109 on Enclosed Return Postal Card.



Master Concrete Bridge Deck Finisher

Headlamps for Scrapers

Three new rugged PAR-46 headlamps, for use on earth-moving equipment, have been introduced by GE's Miniature Lamp Department.

Designated by G.E. as CIM (Construction-Industrial Machinery) headlamps, they were developed to meet operational requirements for scrapers and other fast moving vehicles. For these vehicles and operations requiring a broad flood of light, the existing CIM floodlamps, numbers 4078, 4478 and 4578 may be used. This makes a complete line of floodlamps and headlamps for 6, 12, and 24-volt electrical systems available from General Electric. The new headlamps will direct light far ahead while loads are being hauled at high speed to the dumping point. In addition, they are especially constructed to withstand shock and vibration when used in appropriate lamp housings.

General Electric, Miniature Lamp Department, Nela Park, Cleveland 12, Ohio.

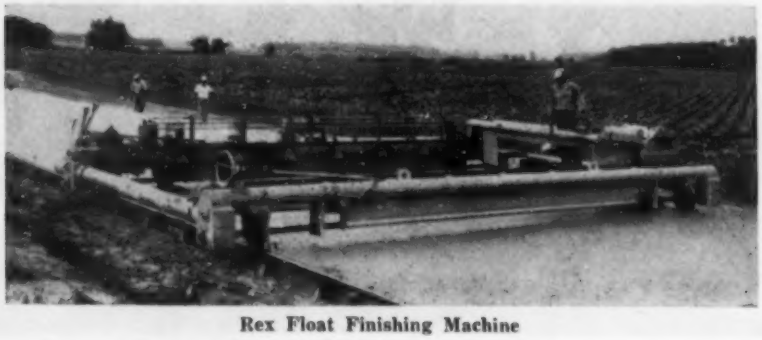
For more details circle 110 on Enclosed Return Postal Card.

Road Finishing Float

A longitudinal float road finishing machine has been added to the line of Rex road building equipment. The actual finishing operation is accomplished by a carriage which travels transversely between the tabular frames on a set of single crown rails. Crown adjustment is done through a single point handwheel control at the front and rear of the machine for each crown rail. An independent power unit on the floating carriage allows independent control of carriage speed and traction speed. Automatic mechanical trip lever on the unit reverses carriage direction at each end of the cycle.

Chain Belt Co., 4701 W. Greenfield Ave., Milwaukee 14, Wisc.

For more details circle 111 on Enclosed Return Postal Card.



Rex Float Finishing Machine

Highway Flasher

A new electronic highway hazard warning flasher, introduced by R. E. Dietz Co. is claimed to be approximately 3 times brighter. Designated the No. 604 "Super-Visi-Flash," this compact flasher concentrates the light in a full-faced brilliant beam that is highly visible over the entire width of the road. It is double-faced to provide protection from either direction.

The No. 604 features two-way polished aluminum reflectors plus combination bulls-eye and wide-angle prism lens. Resulting brilliance is stated to alert motorists to highway hazards over 2500 yards in advance.

Portable and Hazard Lighting Division, R. E. Dietz Co., 225 Wilkinson St., Syracuse, N. Y.

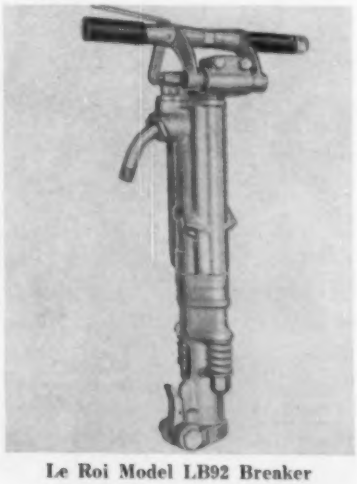
For more details circle 112 on Enclosed Return Postal Card.

No. 604 Super-Visi-Flash

Breakers and Drivers

A new heavy-weight paving breaker with a shock absorbing handle, the LB92, is now available from LeRoi Division. Vibration is absorbed by rubber cushions incorporated into the mechanism of an offset handle.

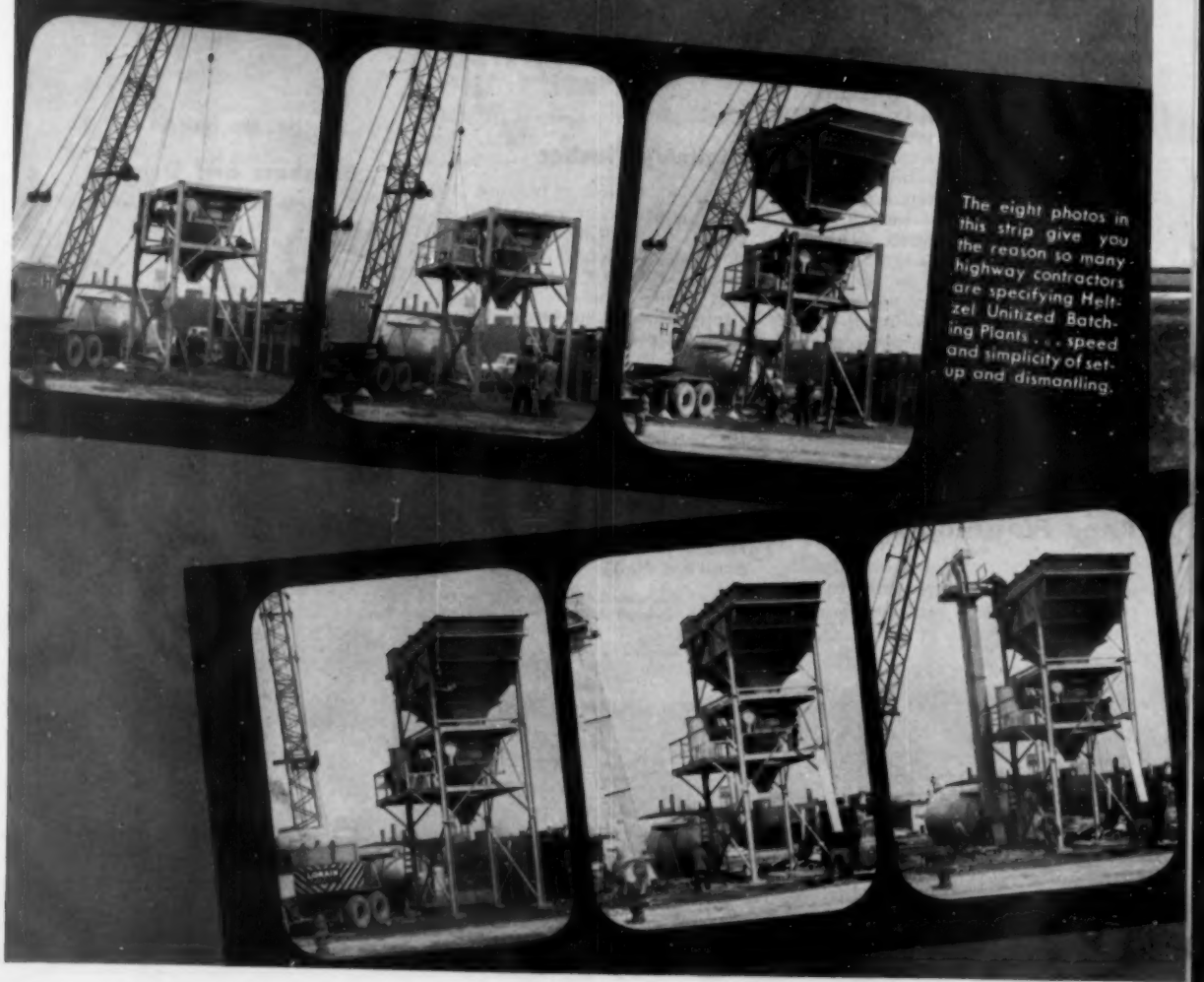
The LB92 is the second breaker with the new handle recently announced by LeRoi, and is available as a paving breaker, sheeting driver, or spike driver. The shock absorbing handles of both the LB92 and the earlier LB75 are an adaptation of the handles Le Roi in-



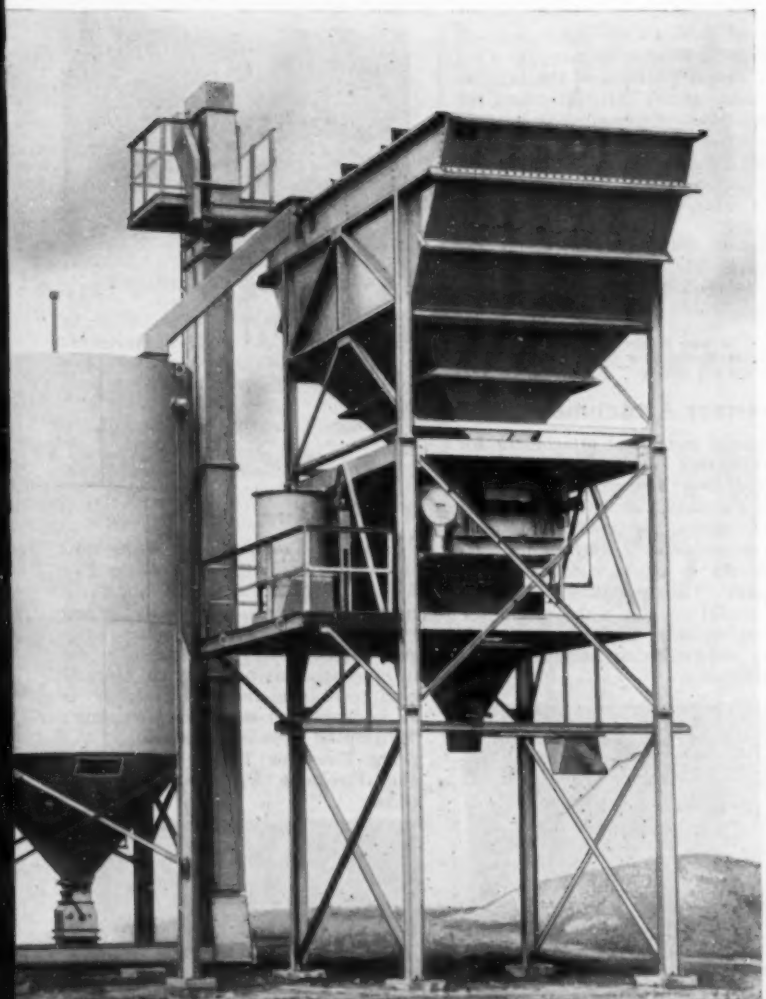
Le Roi Model LB92 Breaker

(Continued on page 114)

This extra-portable new Heltzel Unitized Batching Plant sets up faster . . . combines dry batch and truck mix

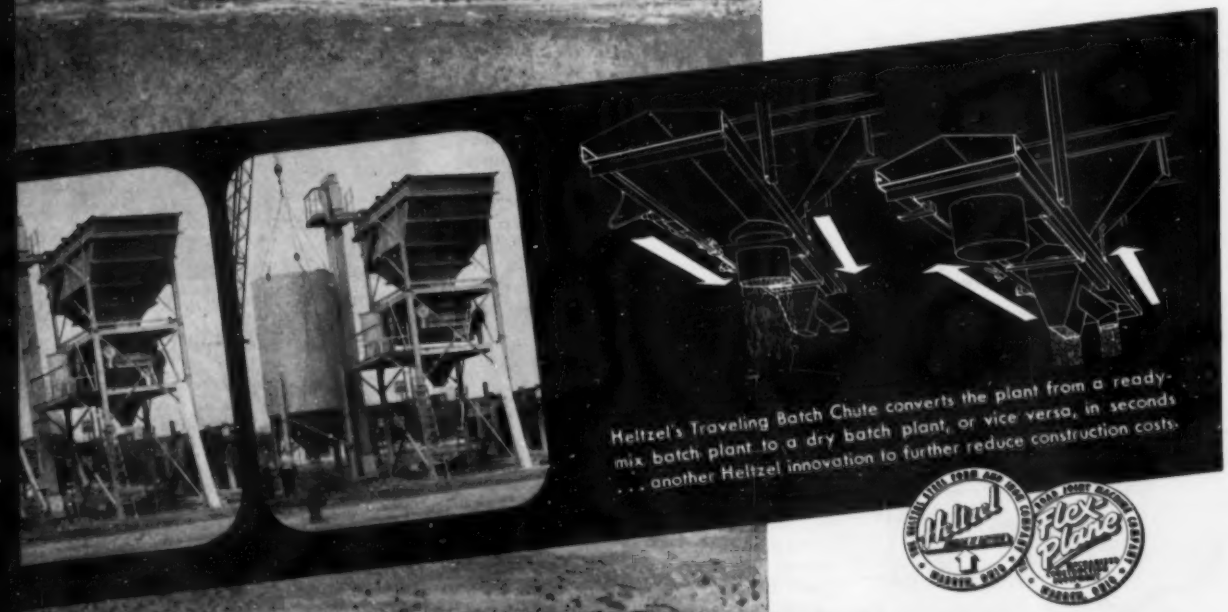


The eight photos in this strip give you the reason so many highway contractors are specifying Heltzel Unitized Batching Plants . . . speed and simplicity of set-up and dismantling.



Heltzel's new Unitized Plant goes together while you watch. It's the ultimate in portable batching equipment! The batching plant is factory assembled in three easy-to-handle sections that require only a minimum crew and standard crane equipment to set up. The factory assembled elevator comes as one complete unit that is easily set in place. The one-piece cement bin completes the basic assembly. For the first time an entire plant—batching section, storage and elevator sections—has been designed to give highway contractors a completely unitized, one-stop, truck mixer charging plant that is also well suited as a dry batch paving unit.

What's more, this is a Heltzel plant in every way. At no point in its design or construction did the engineers sacrifice Heltzel quality. In fact, because scales, batchers, etc., are factory assembled, it's exactingly accurate and extremely fast—the finest engineered portable batching equipment developed to date. Make sure you have all the information on this time-saving packaged plant before you buy your next unit.


Heltzel's Traveling Batch Chute converts the plant from a ready-mix batch plant to a dry batch plant, or vice versa, in seconds
. . . another Heltzel innovation to further reduce construction costs.

THE HELTZEL STEEL FORM AND IRON CO. WARREN, OHIO

. . . for more details circle 273 on enclosed return postal card

New Products

(Continued from page 111)

troduced last year on its line of sinker drills.

The Model LB92 is 30 in. long and weighs 92 lb length of the sheeting driver 32¼ in. and weight is 124 lb. The spike driver is 29⅞ in. long and weighs 87½ lb.

Le Roi Division of Westinghouse Air Brake Co., Milwaukee 1, Wis.

For more details circle 113 on Enclosed Return Postal Card.

Curb and Trench Backfiller

Trench Backfiller

Improvements on its curb and trench backfillers have been announced by Power-Pack Conveyor Co. A more powerful conveyor drive permits faster discharge of material at a rate stated to be 180 tons per hour.

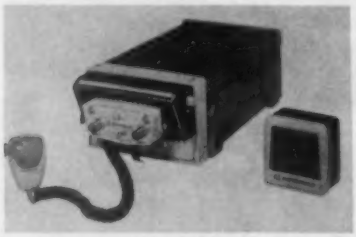
Design improvements further simplify attaching the unit to trucks for operation or towing to other jobs, and assure greater stability and accuracy while discharging material. Attachments for the improved machine permit filling of trenches up to 8 ft from the pavement and laying of sand, stone and hot mix for road widening and shoulder work.

Power-Pack Conveyor Co., 836 E. 140th St., Cleveland 10, Ohio.

For more details circle 114 on Enclosed Return Postal Card.

T-Power Radiophone

A new mobile 2-way radiophone operating in the 450-470 MC frequency band, announced by Motorola, features a transistorized power supply and an advanced unified chassis design which combines transmitter, receiver and power supply portions of the unit on one chassis rather than three and improves overall equipment reliability.



Motorola 450-470 MC T-Power 2-Way Radio

The new model weighs but 34 lb. compared to 74 in former 450-470 MC mobile radiophones. It is packaged to enable either under-dash or trunk mounting.

Motorola, Inc., Communications and Industrial Electronics Division, 4501 West Augusta Boulevard, Chicago 51, Ill.

For more details circle 115 on Enclosed Return Postal Card.

Pulverizer Attachment

A special pulverizer attachment for Barber-Green's Model 82-A (crawler mounted long boom) or Model 582 (crawler mounted, short boom) bucket loaders enables these machines to strip to accurate grade, pulverize, and load into trucks in a single, one-machine operation. The combination is especially useful in clay stabilization for roads and in other work requiring pulverized soil-gardening, industrial clay products, etc.

Barber-Green Bucket Loader with Pulverizer

The pulverizing effect comes from the flailing action of a series of free-swinging short chains driven by a small independent engine. The attachment is available on new loaders from the factory or for field installation on machines already in operation. It can be disengaged easily and swung aside to permit unhindered loading of aggregate or similar bulk materials.

Barber-Greene Company, 400 N. Highland Ave., Aurora, Ill., or Barber-Greene Canada Ltd., Don Mills, Ontario.

For more details circle 116 on Enclosed Return Postal Card.

Dump Body

A new lightweight dump body, the "Twin Yard Bird," made specially for one-ton truck chassis, has been announced by Anthony Co. Body is constructed of 12 gauge steel. Powerful 2-ton lift capacity is provided by a twin head lift high pressure hoist. The hoist has a full subframe to take stresses, and thus puts no strain on the truck frame. It is driven by power take-off from truck transmission. "Twin Yard Bird" bodies are available in lengths of 8, 9, and 10 ft. All bodies are 78 in. wide. Both a 3-cu yd and a 4-cu yd capacity are available in each body length.

New "Twin Yard Bird"

Anthony Company, Streator, Ill.

For more details circle 117 on Enclosed Return Postal Card.

Tractor Tire

The "All-Traction" tractor tire now in production by The Firestone Tire & Rubber Co., contains Rubber-X, a new rubber compound. Tread life and body strength are claimed to have been substantially increased through the use of the new compound. An original equipment tire, the "All-Traction" is an improved version of the company's "Champion Ground Grip" tire.

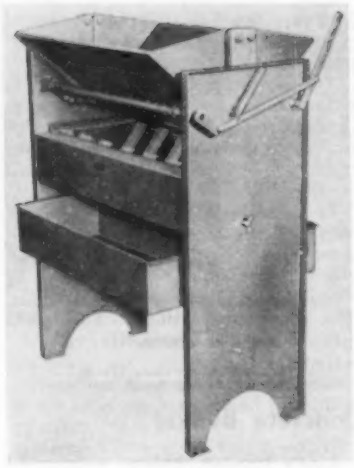
The Firestone Tire & Rubber Co., 1200 Firestone Parkway, Akron 17, Ohio.

Firestone "All-Traction" Tractor Tire

For more details circle 118 on Enclosed Return Postal Card.

Sample Splitter

An improved sample splitter for the reduction of aggregates, from sand through coarse sizes, announced by Gilson Screen Co., performs functions for which two or three separate items of equipment were formerly required. In using the new splitter, the sample to be reduced is placed in a lever-actuated clamshell hopper where it may be leveled or evenly distributed by hand. The sample may consist of a pound of fine material, or more than a cubic foot of coarse aggregate. Lever-opening of



Improved Gilson Sample Splitter With Two Material Pans in Place.

the hopper releases the sample precisely on the center line of the splitter chutes below. Each half of the resulting split retains the character and gradation of the original total sample.
Gilson Screen Co., Malinta, Ohio.

For more details circle 119 on Enclosed Return Postal Card.

Truck Tire

A new off-the-road truck tire, introduced by the Goodyear Tire & Rubber Co. for use in construction service, is squared off and widened in the shoulder area to give improved wear and traction.

Named the "Super Hard Rock Lug," the tire is made in all wide-base sizes, and is available in tubeless and tube-type versions. It is built with special cut-resisting rubber compounds and Goodyear's triple-tempered 3-T nylon cord. Due to the added rubber in the deepened and widened shoulder area, the tire's squared appearance, rather than conventional curved shape is claimed to mean more of a working footprint in ground contact.
The Goodyear Tire & Rubber Co., Akron 16, Ohio.

For more details circle 120 on Enclosed Return Postal Card.

Two-Way Radio

A new 450-MC pre-amplifier for two-way radio has been introduced by General Electric. The unit increases sensitivity of the receiver at the office location, thus improving the effective talk-back range of mobiles associated with the system without the necessity of adding equipment to the radio unit in the car itself. However, the pre-amplifier can be used in the car if desired.
General Electric Communications Products Department, Electronics Park, Syracuse, N.Y.

For more details circle 121 on Enclosed Return Postal Card.

Profit-Paying WAUKESHA POWER

FOR CRANES AND SHOVELS

WAUKESHA 135 DIESEL
Torque Converter Package—
4¼ x 5-in., 426 cu. in.

●

WAUKESHA VLRD8SU
V-12 Turbo-Supercharged DIESEL
8½ x 8½-in., 5788 cu. in.

Complete size range to 1235 hp . . . all standard fuels.

387

WAUKESHA MOTOR COMPANY, WAUKESHA, WISCONSIN

NEW YORK TULSA LOS ANGELES

. . . for more details circle 316 on enclosed return postal card

Hasselbalch "Bee-Line Finisher"

Motor Grader Attachment

A new motor grader moldboard attachment, the hydraulically-operated "Bee-Line Finisher," is said to reduce grade finishing time substantially. It extends the moldboard reach and operates with exact hydraulic control at any angle from 45 deg. up to 45 deg. down. With the attachment angled down, it is practical to brush the top of the grade and strike the shoulder line clean and fast to specifications. Currently available for all Caterpillar No. 12's back to 9K 2912, and for Adams models 660, 550, 440, and 330.

Hasselbalch & Sons, 1112 Capital, Omaha, Neb.

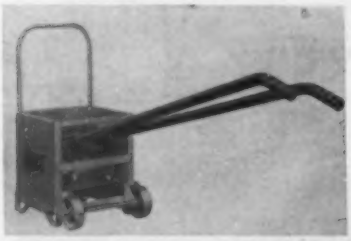
For more details circle 122 on Enclosed Return Postal Card.

Two-Way Radio

An add-on 250/330 watt economy power package, announced by General Electric, promises substantial savings to two-way radio owners who need greater communication range. The package, to be known as the "General Electric Power-Mate," is stated to enable users of transmitters in the lower power ranges to upgrade their present systems to as high as 330 watts at half the cost they normally would pay for a complete 330 watt station.

General Electric Communication Products Department, Electronics Park, Syracuse, N. Y.

For more details circle 123 on Enclosed Return Postal Card.



Wheel Model "Mighty Midget" Heater (Skid Model Is Also Available)

Asphalt Tool Heater

A small, easily handled heater for asphalt smoothing irons has been developed by Hauck Manufacturing Co. Known as the "Mighty Midget", the heater holds two irons. It is stated it will heat these irons in one-third to one-half the time required in conventional fire wagons.

The heater can be operated on the ground, on the floor of a truck or permanently mounted in the truck. It is fast heating, yet safe and comfortable to work around. A 20-lb. LP gas bottle operates the heater for two days. It lights instantly without preheating, and is said to require no maintenance.

Hauck Manufacturing Co., 124-36 Tenth St., Brooklyn 15, N. Y.

For more details circle 124 on Enclosed Return Postal Card.

Crane-Hoe Combination

Time-saving accessibility, low-cost maintenance, versatile crane-excavator service and fast, rubber-tired mobility, are advantages claimed for the new Model 11-B transit machine of Bucyrus-Erie. It is readily converted from a 10-ton lifting crane to a dragline, clamshell or hoe.

The 11-B is mounted on a modern 6-wheel-drive carrier. Several new features are tailored for contractors faced with low budget or high overhead

Bucyrus-Erie 11-B Transit Hoe

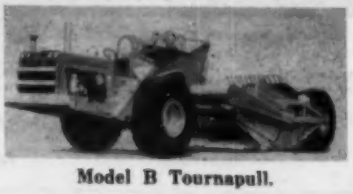
problems. The emphasis is on ease of maintenance and quick accessibility. For example, the hoist shafts, horizontal transmission shaft, horizontal swing shaft and swing circle are unit, or bench assemblies. Each is designed to permit quick service or easy replacement as a unit. Designed as a unit assembly, the new swing circle features a double row of bearing balls in place of swing and hook rollers.

Bucyrus-Erie Co., South Milwaukee, Wisc.

For more details circle 125 on Enclosed Return Postal Card.

Power Scraper

Horsepower has been increased to 335 and capacity has been boosted to 21 yd. struck and and 28 yd. heaped on the Model B "Tournapull". The new standard engine is a Cummins six-cylinder, four-cycle diesel with turbocharger. The combination of this turbocharger and a newly designed ground



Model B Tournapull.

gear, precision flow fuel pump is stated to provide superior acceleration characteristics.

The power increase is reflected in higher speeds. The Model B with standard step gear transmission is now capable of low range speeds up to 20.7 m.p.h., while in high range, top speed has been increased to 30.1 m.p.h.

An increase in horsepower also has been made in the optional GM Detroit Diesel six-cylinder two-cycle engine which is available in the Model B. This engine is a 325-hp. unit.

Le Tourneau-Westinghouse Co., 2301 N.E. Adams St., Peoria, Ill.

For more details circle 126 on Enclosed Return Postal Card.

Concrete Bucket

A new concrete bucket, announced by Blaw-Knox, utilizes the weight of its concrete load to generate the hydraulic pressure needed to operate the opening and closing mechanism.

The bucket, with no outside source of power, is equipped with an integral hydraulic system. It literally hangs on two hydraulic cylinders. The operator merely turns a valve to open the bucket and releases the valve to close it. Every time the bucket is set down, the cylinder is, in effect, recharged.

Self-Powered 4 cu. yd. Concrete Bucket

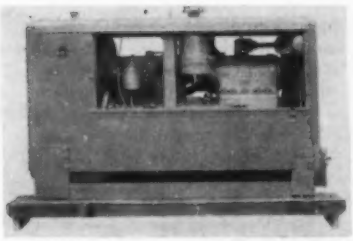
An auxiliary radio remote control system is also available, making it possible for an operator stationed 75 to 100 feet away, to open and close the bucket, without any physical contact with the bucket. One transmitter can operate any number of buckets without danger of the radio signal activating the wrong mechanism.

Blaw-Knox Company, 300 Sixth Ave., Pittsburgh 22, Pa.

For more details circle 127 on Enclosed Return Postal Card.

Truck Compressor

A special 125-cfm compressor, announced by Davey Compressor Co., is designed for cross-mounting on motor trucks. Known as Model 125-RP "Hydrovane" rotary skid, the new unit fea-



Model 125-RP Hydrovane Rotary Skid

tures a compact weatherproof control panel mounted on the curb end of the compressor. Located adjacent to clutch lever and air outlets, this permits easy one-man operation. The compressor is 81 in. long, 34 in. wide and 51 in. high. It weighs 2300 lb.

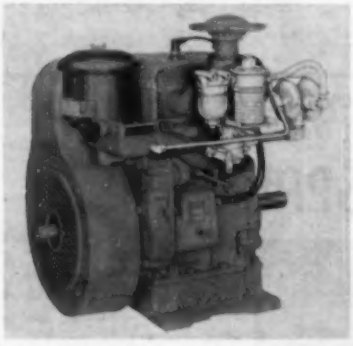
Davey Compressor Co., Kent, Ohio.

For more details circle 128 on Enclosed Return Postal Card.

LPG Air-Cooled Engines

A complete line of LPG engines has been announced by Wisconsin Motor Corporation. These engines have been specially designed for operation on liquid petroleum fuels (Butane, Propane, or a mixture of both).

The LPG line of Wisconsin heavy-duty, air-cooled, 4-cycle engines includes a full range of sizes from single cylinder models to 2-cylinder and



Model THDG Wisconsin 2-cylinder LPG Heavy-Duty Air-Cooled Engine

V-type 4-cylinders models in a complete power range from 21½ hp to 55 hp. These engines are designed for operation either with a liquid withdrawal system or a vapor withdrawal system.

Special LPG conversion kits will also be supplied for converting standard Wisconsin gasoline engines to LPG operation.

Wisconsin Motor Corporation, Milwaukee, Wis.

For more details circle 129 on Enclosed Return Postal Card.

Form Lubricant

A new smooth-parting, non-caking form lubricant for pre-stressed concrete beams and pipes has been introduced by Shell Oil Co. Called Shell Form Compound, the new form release agent

There's no paint on Lufkin Chrome Clad Anchor Tape lines.

The bold, black markings are bonded to the basic metal . . . protected with several electroplatings that give extra strength to the line. The final metal coat is Lufkin's exclusive Chrome Clad finish. Glare free, smooth, rust resistant . . . the most durable tape line you can buy.

Anchor lines are replaceable in the genuine-leather, hand-stitched case. Available with markings in feet, 10ths and 100ths.

THE LUFKIN RULE COMPANY
TAPES • RULES • PRECISION TOOLS
SAGINAW, MICH. • NEW YORK CITY • BARRIE, ONT.

. . . for more details circle 293 on enclosed return postal card

One of three ARROW MOBILE HYDRAULIC HAMMERS, owned by a Los Angeles area contractor, tamping trench backfill.

CONTROLLED IMPACT

Automatic Stroke

Creeper Drive

For Compacting to Critical Specifications

With an ARROW MOBILE HYDRAULIC HAMMER, you can control the force of your compacting blows; from gentle, earth-packing pats to as much as 8,000 foot pounds per blow. Compacting specifications can be met with very light vibration and complete safety to sub-surface structures. Prove this to yourself—whether your job is compacting, breaking concrete, cutting asphalt or driving posts or piling—ARROW MOBILE HYDRAULIC HAMMERS are your best buy.

ASK YOUR DEALER FOR A DEMONSTRATION

Arrow Manufacturing Company

196 WEST DAKOTA DENVER, COLORADO

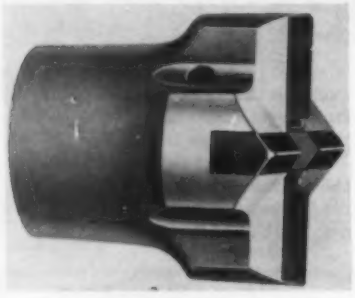
. . . for more details circle 236 on enclosed return postal card

is claimed to permit quick stripping of concrete members, and to leave concrete with a glossy, almost marblike surface. It does not build up on the forms.

Shell Form Compound is a water emulsion material mixed just before use in a ratio of 1 part compound to 5 parts water. Three gallons or less will cover a full 420-ft. double-tee bed. Ordinary spraying equipment is adequate for application to steel and wood forms for all types of prestressed structural members.

Shell Oil Co., 50 West 50th St., New York 20, N. Y.

For more details circle 130 on Enclosed Return Postal Card.



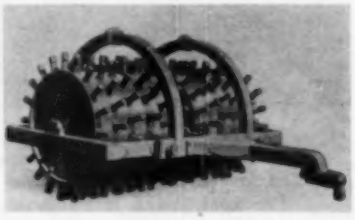
Cutaway Type Carbide "Rok-Bit"

Cutaway Rok-Bit

A new cutaway type carbide "Rock-Bit" is offered by Brunner and Lay for use in rock formations where better clearance is needed and extraction of the bit is difficult. The bit has self-clearing chip channels and fast cutaway wings, designed to minimize "drag" and "binding." Available in gauge sizes—1½ in. through 4 in.

Brunner & Lay, Inc., 9300 King St., Franklin Park, Ill.

For more details circle 131 on Enclosed Return Postal Card.



Southwest Model 55RR. Roller

Sheepsfoot Roller

A new Southwest Model 55RR arch-type, heavy duty sheepsfoot roller is designed specifically for use in tandem behind Caterpillar D9 tractors or equivalent machines. Latest production line model of Southwest tamping rollers, the 55-RR retains all the proved qualities of Southwest equipment in addition to the reinforced arch-type frame to allow accurate control in tandem applications.

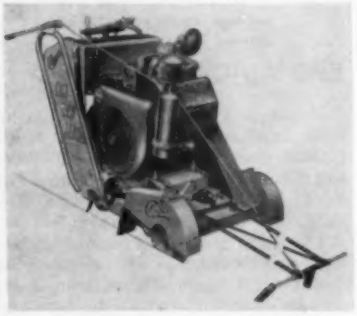
Southwest Welding & Mfg. Co., Construction Machinery Division, 3201 W. Mission Road, Alhambra, California.

For more details circle 132 on Enclosed Return Postal Card.

30-HP Concrete Saw

A new concrete saw, Model C-300, announced by Clipper Manufacturing Co. features a 20% increase in power over the C-250 which it replaces in the Clipper line. The new model uses a 30-hp Wisconsin engine, with a more powerful transmission.

The C-300 features a clutch type



Model C-300 Concrete Saw

ONE MAN Operates Snow Plow From the Cab . . . AUTOMATICALLY!

POWER MONARCH HYDRAULIC CONTROLS

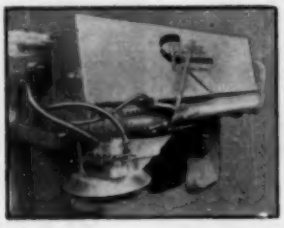
Instant action! Snow removal is easier, faster, more efficient. Automatic snow plow operation right from the truck or jeep cab. Battery-Operated or Fan-Belt Driven Models. See your dealer or write for full information.

MONARCH ROAD MACHINERY COMPANY
1331 Michigan St., N. E. — Grand Rapids 3, Michigan

. . . for more details circle 296 on enclosed return postal card

Before You Buy—
See The Latest Developments By—

FLINK SPREADERS



For Fast Efficient Ice Control. New model illustrated spreads from left side only . . . saves material and gives better pattern. Also choose from many other hydraulic, cab-operated spreaders; PTO or engine driven hopper types; or the low cost pull-type spreader.

Baker-Flink SNOW PLOWS

For Safe, High Speed Snow Removal. Reversible and one-way plows for 1½ to 5 ton trucks and up. Hydraulic power lift controls to meet your specifications. Underframe or front push models.

THE Flink co.

For illustrated literature or to have an engineer-representative call, write:

STREATOR, ILLINOIS
5515 North Vermillion Street

. . . for more details circle 266 on enclosed return postal card

water pump that eliminates the necessity of disconnecting the water pump belt when running the saw dry, or when idling for extended periods of time. The new pump also features bypass piping to reduce the volume of water used.

Clipper Manufacturing Co., Suite 232, 2800 Warwick, Kansas City 8, Mo.

For more details circle 133 on Enclosed Return Postal Card.

Auburn Trencher on Work Bull 202 Tractor

Tractor-Trencher

The Auburn "Gear-Draulic" trencher has been added to the list of power-matched attachments for the Work Bull 202 industrial tractor of Massey-Ferguson. The rig is claimed to dig up to 600 to 800 ft. per hour, to compensate automatically for varying ground conditions, and to handle trenches up to 6 ft. deep in 6 to 14-in. widths.

Massey-Ferguson Industrial Division, 1009 South West St., Wichita, Kansas.

For more details circle 134 on Enclosed Return Postal Card.

Aerial Plotter

The "Balplex 760" plotter has been added to the line of photogrammetric mapping equipment of Bausch & Lomb. It provides 5X enlargements of the original aerial negative, claimed to make it especially well-suited for highway and waterway mapping projects

New Bausch & Lomb "Balplex 760"

acker core drills

do the "underground work" wherever highways are underway!

Contractors FROEHLING & ROBERTSON, INC., of Baltimore own the trailer mounted Acker TH Core Drill shown above. It is doing test boring for the new Cumberland Highway.

Wherever highway construction is underway, you will find Acker Equipment engaged in "underground" exploration work.

And, there's good reason!

Acker Rigs are compact, dependable and ruggedly built. Like the Acker TH Core Drill pictured, they can be furnished completely self-contained with water pump, derrick, cargo-type winch, choice of power plant and mounting on trailer, truck or jeep.

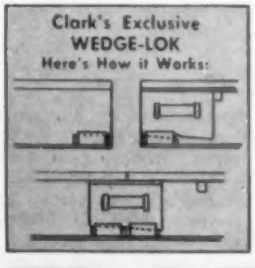
For the complete story on why Acker Core Drills are preferred by leading contractors and engineers, please write for Bulletin 30. R & S.

ACKER DRILL CO., Inc.
P.O. Box 830 • Scranton, Pa.

Over 40 years of experience manufacturing a complete line of diamond and shot core drills, accessories and equipment.

. . . for more details circle 233 on enclosed return postal card

Laying concrete with Clark Wedge-Lok forms on Route #25, bypass, Findlay, Ohio.



Clark forms are specially designed for modern high speed construction. The exclusive Wedge-Lok and self aligning stake pocket feature reduces form setting time to a minimum. Joint deflection is eliminated.
Ask your Dealer to show the complete Wedge-Lok line of curb and gutter forms and sidewalk forms.

For additional information and brochures contact your nearest Wedge-Lok Dealer or write, wire or call.

CLARK INDUSTRIES
Construction Equipment Division
375 East Fifth Avenue • Columbus, Ohio
A Unit of the Clark Grave Vault Company

. . . for more details circle 253 on enclosed return postal card

BONDED BUY

an exclusive of your Caterpillar Dealer

BONDED BUY

You *know* what you're buying from your Caterpillar Dealer. On used Cat-built equipment he offers you a "Bonded Buy" backed by his Guarantee Bond up to $10,000—your assurance of satisfactory performance and guarantee of all parts.

Look for the "Bonded Buy" symbol—*your* guarantee of the best buy in used equipment.

Ask your Caterpillar Dealer about his "Certified Buy" and "Buy and Try" guarantees on used equipment, too. For the *safest* buy on the market, see your Caterpillar Dealer.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

BEST BUY IN NEW AND USED EQUIPMENT

where large scale accuracy and detail are of primary importance. The "760" also provides such features of the standard "Balplex" as permanent calibration, low initial operating costs, and ground control extension capability.

Photogrammetric Department, Bausch & Lomb Optical Co., 635 St. Paul St., Rochester 2, N.Y.

For more details circle 135 on Enclosed Return Postal Card.

This Unit Is 22 ft. long, Has a 26-cu. yd. Capacity and Weighs 7,940 lb. Including Hydraulically Operated, Five-Sleeve, Telescopic Lifting Cylinder.

Aluminum Dump Trailer

A full-frameless aluminum dump trailer has been added to the line of the Lodestar Corp. The units are available in 20 to 28-ft. lengths with capacities of 16 to 31 cu. yd. All of the trailer is aluminum except for the steel latching mechanism, bearings and bushings. The floor is a formed, one-piece unit with a 1½-in. flange to which the side panel, also a formed, one-piece unit is welded. Rigidity is provided by special longitudinal and cross members.

Lodestar Corp., Niles, Ohio.

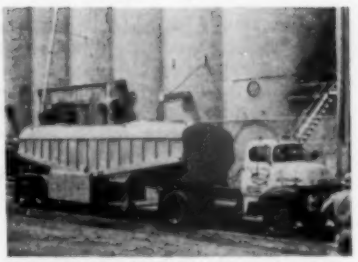
For more details circle 136 on Enclosed Return Postal Card.

Truck Tire

A new design truck tire, announced by the General Tire & Rubber Co. has a 60% deeper than normal tread. Named the D.C.L. (Deep Cross Lug), the new tire has a Nygen carcass and wide flat contour. Half-way between the tread center and the shoulder it has a 29/32-in. non-skid depth. A cross-lug design, the tread has a circumferential, running center rib with jagged "outrigger" bars jutting out to the sidewalls at regular intervals for stability and traction.

The General Tire & Rubber Co., Akron, Ohio.

For more details circle 137 on Enclosed Return Postal Card.



Fruehauf Air-Slide Pump Trailer

Air-Slide Pump Trailer

A new design 35-ft. Fruehauf air-slide trailer, in a demonstration, is stated to have delivered cement 147 ft. at a rate of 1 bbl every 29 seconds. The trailer demonstrated had a capacity of 800 cu ft. Overall height was 10 ft 3 in. Three hatches were spaced along a runway on top.

The product hauled in the trailer is discharged into the air-slide pump at the center. It is operated by a 36-hp air-cooled engine, which also provides power for compounded blowers and the air-slide blower. The pump is governed by pressure inside the pump body. When pressure drops (unloading) solenoid switches open twin hydraulic valves, allowing additional material to drop into the air-slide pump. Valves are closed by the same means (when full).

Fruehauf Trailer Co., Detroit 32, Mich.

For more details circle 138 on Enclosed Return Postal Card.

Improved 3-Axle Trailer Suspension

3-Axle Trailer Suspension

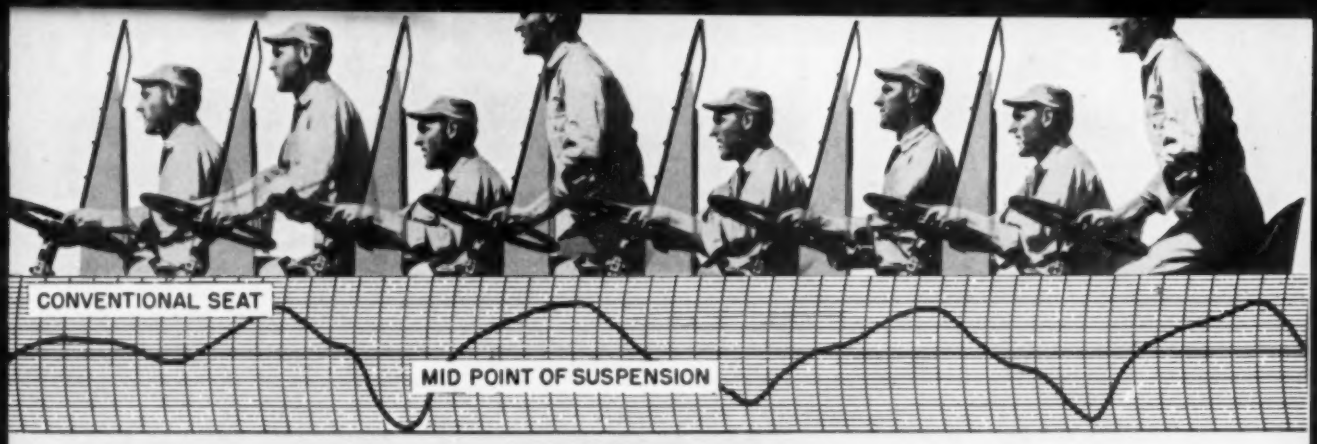
Improvements to its exclusive Martin rubber-mounted 3-axle suspension, available on rear loading models in the Martin line, have been announced by Hyster Company, Martin Trailer Division. All directional wheel oscillation, made possible by special formulated rubber bushings at ten points, has been increased by over 50% to give the trailer improved roadability, maximum flexibility and increased tire life. The entire suspension requires lubrication at only two points. Greater oscillation has been accomplished without increasing the distance between the platform and the top of the tires. Also, the torque rod on the center axle has been eliminated.

Hyster Company, Martin Trailer Division, Kewanee, Ill.

For more details circle 139 on Enclosed Return Postal Card.

(Continued on page 133)

. . . for more details circle 249 on enclosed return postal card



Operator efficiency increases with . . . the new Caterpillar Torsionflex Seat

New Torsionflex Seat for Caterpillar wheel Tractors increases operator efficiency and comfort—provides a "highway" ride in off-highway conditions. Note the difference between the ride in the Torsionflex Seat and the conventional seat, as illustrated by this graph made over the same rough test course.

The Torsionflex Seat is just one of many new features introduced by Caterpillar to help increase earthmoving production!

Over the years Caterpillar has been the leader in improving earthmoving equipment with one aim in mind: *to move more dirt faster at lower cost.* No advance, from strengthening a 7-pound piston to redesigning a 30-ton rig, has been overlooked to increase the efficiency of Caterpillar-built machines, as well as the efficiency, comfort and safety of the men who operate them!

Now, in the new Torsionflex Seat, Caterpillar introduces a new concept in wheel tractor seat suspension—to give the operator maximum comfort over the roughest terrain. The new seat conserves his energy, lessens his fatigue, enables him to do more work per shift.

Test course proves superiority of Torsionflex Seat

The graph here shows the improved ride made possible by the Torsionflex Seat. Two rubber-tired machines, one with this new seat and the other with the conventional seat, were run over the same rough test course at the same speed. The lines in the graph were plotted by instruments attached to the operator. The horizontal component of the lines represents forward travel by the operator, while the vertical component represents his up and down motion. Note the big difference in the ride!

The new seat is just one of many improvements, large and small, being made constantly by Caterpillar throughout its line—tractors, scrapers, motor graders, other earthmovers. For modern, heavy-duty equipment that will increase your production and lower your costs, see your Caterpillar Dealer!

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

LEADER IN FEATURES THAT INCREASE PRODUCTION AND LOWER COSTS

. . . for more details circle 248 on enclosed return postal card

TWIN LOADERS

(Continued from page 90)

That amount of surge storage lets the belts continue to operate while hauling trucks maneuver under the bunkers. The trucks are loaded in about 16 seconds by a double gate arrangement, operated from the truck dumping level.

The trucks weigh their 22 to 25 ton loads over either of the two Murphy scales, take them out to the highway, and place the material through Pettibone-Wood spreader boxes. After that the moisture is added by sprinkler trucks and the material is bladed out and rolled. Later the upper 6 in. depth will receive cement treatment—again with doubled-up equipment.

Despite the low bid price, the subbase item is, by the means here outlined, being kept on the black side of the ledger. Part of the credit is due to the equipment; much of the credit is due to the ingenuity and foresight of this contractor's staff.

Dow's Film Timely For Public Hearings

Public hearings on location of the new Interstate System is the subject of Dow Chemical Company's public service motion picture "Highway Hearing." Dow's half-hour color film, already attracting a fast-growing interest, is expected to be even more in demand because of the broadened hearing requirement.

Released earlier this year, "Highway Hearing" depicts a typical public hearing on an Interstate highway location. Purpose of the film is to help build increased public understanding of the federal highway program.

Further information on the motion picture is available from the Public Relations Department, The Dow Chemical Company, Midland, Michigan, or from any of Dow's 18 field sales offices.

IMMEDIATELY RECOGNIZED VALUE

in the ROGERS Top Value Trailer

brought requests for larger similar units

We Responded and Now Offer a

35 Ton Capacity TVT TRAILER

with all the features of the 25 Ton unit — lightness with strength — ease of loading and hauling and other desirable features — at a new low price.

Choose the 25 Ton or 35 Ton TVT with level deck as illustrated above or drop deck to provide greater headroom clearance for high loads.

TREMENDOUS VERSATILTY TOO IS FEATURED IN THIS ROGERS TRAILER

Get Complete Information — Be Surprised And Pleased At The Advanced Construction And Low Cost.

ROGERS LOW BED—HEAVY DUTY TRAILERS

ROGERS BROS. CORP. ALBION, PENNA.

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SIMPLICITY S-200 STRUTS HER STUFF

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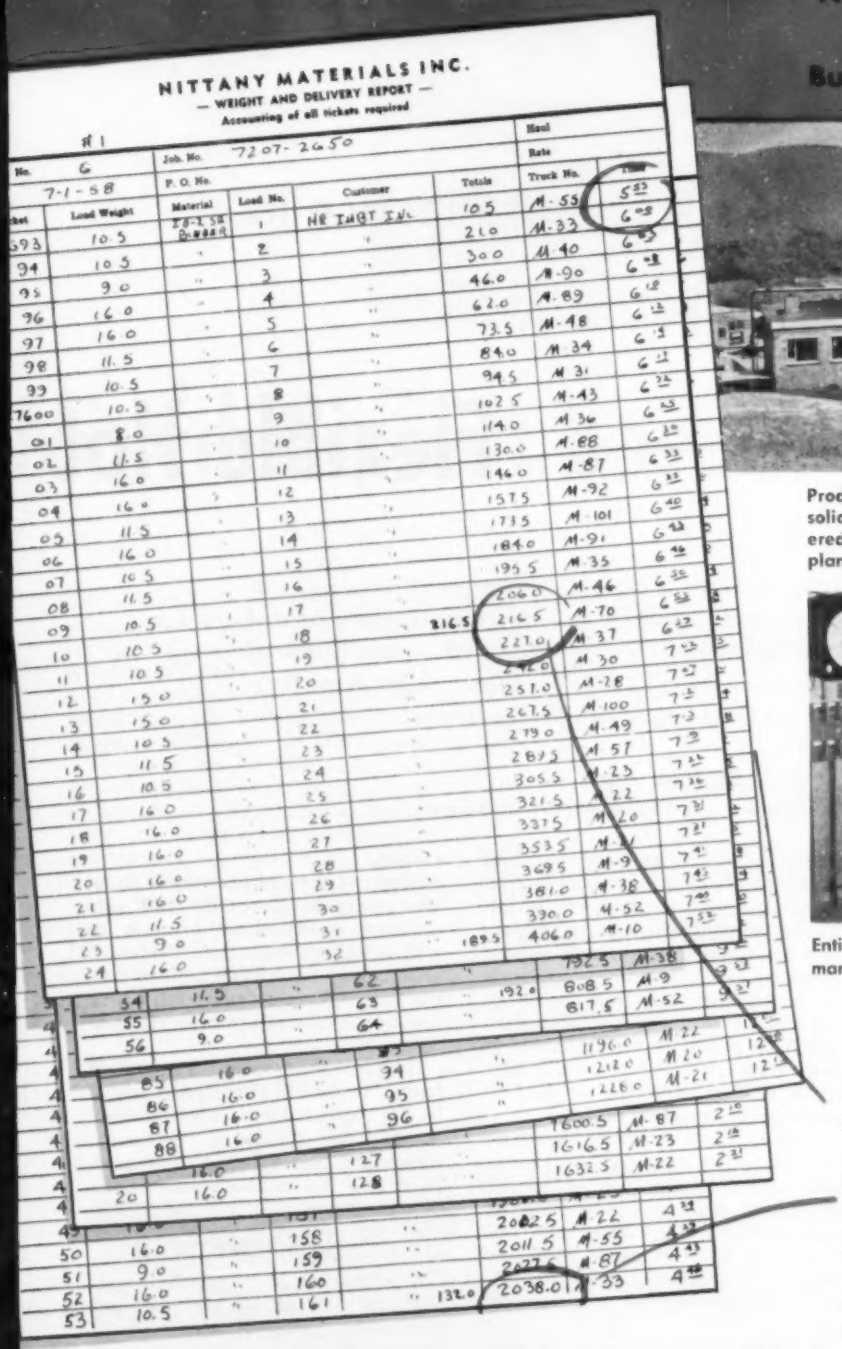


NITTANY MATERIALS INC.

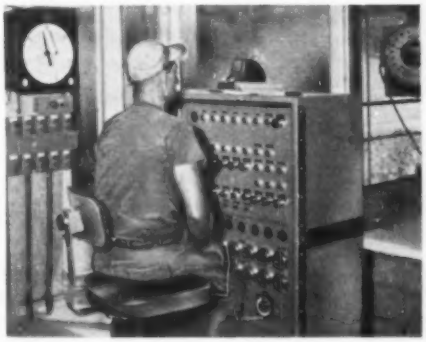
— WEIGHT AND DELIVERY REPORT —

Accounting of all tickets required

#1

No.	Job. No.	7207-2650				Haul	
6						Rate	
7-1-58	P. O. No.						
Ticket	Load Weight	Material	Load No.	Customer	Totals	Truck No.	Time
693	10.5	7-1-58 D-#884	1	NR IMBT INC	10.5	M-55	5 53
94	10.5	"	2	"	21.0	M-33	6 05
95	9.0	"	3	"	30.0	M-40	6 23
96	16.0	"	4	"	46.0	M-90	6 28
97	16.0	"	5	"	62.0	M-89	6 38
98	11.5	"	6	"	73.5	M-98	6 43
99	10.5	"	7	"	84.0	M-34	6 49
7600	10.5	"	8	"	94.5	M-31	6 53
01	8.0	"	9	"	102.5	M-43	6 58
02	11.5	"	10	"	114.0	M-36	7 03
03	16.0	"	11	"	130.0	M-88	7 10
04	16.0	"	12	"	146.0	M-87	7 13
05	11.5	"	13	"	157.5	M-92	7 18
06	16.0	"	14	"	173.5	M-101	7 23
07	10.5	"	15	"	184.0	M-91	7 28
08	11.5	"	16	"	195.5	M-35	7 33
09	10.5	"	17	"	206.0	M-46	7 38
10	10.5	"	18	" 816.5	216.5	M-70	7 42
11	10.5	"	19	"	227.0	M-37	7 47
12	15.0	"	20	"	242.0	M-30	7 52
13	15.0	"	21	"	257.0	M-28	7 57
14	10.5	"	22	"	267.5	M-100	8 02
15	11.5	"	23	"	279.0	M-49	8 07
16	10.5	"	24	"	289.5	M-57	8 12
17	16.0	"	25	"	305.5	M-23	8 17
18	16.0	"	26	"	321.5	M-22	8 22
19	16.0	"	27	"	337.5	M-20	8 27
20	16.0	"	28	"	353.5	M-21	8 32
21	16.0	"	29	"	369.5	M-9	8 37
22	11.5	"	30	"	381.0	M-38	8 42
23	9.0	"	31	"	390.0	M-52	8 47
24	16.0	"	32	" 1895	406.0	M-10	8 52
54	11.5	"	62	"	792.5	M-38	9 33
55	16.0	"	63	" 1920	808.5	M-9	9 37
56	9.0	"	64	"	817.5	M-52	9 42
85	16.0	"	94	"	1196.0	M-22	12 [illegible]
86	16.0	"	95	"	1212.0	M-20	12 [illegible]
87	16.0	"	96	"	1228.0	M-21	12 [illegible]
88	16.0	"			1600.5	M-87	2 10
					1616.5	M-23	2 15
					1632.5	M-22	2 21
20	16.0	"	127	"			
			128	"			
49			157	"	2025	M-22	4 28
50	16.0	"	158	"	2011.5	M-55	4 33
51	9.0	"	159	"	2027.5	M-87	4 38
52	16.0	"	160	"	2038.0	M-33	4 43
53	10.5	"	161	" 132.0			

Production records at left were sent us unsolicited by Nittany Materials, Inc. and covered this Simplicity Electric-powered S-200 plant operating at Stroudsburg, Pennsylvania.



Entire plant operation under control of one man as shown in this air conditioned room.

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● **Polished section of finished highway 6-in. asphalt gravel base, built in 3 layers and 1½ in fine asphalt concrete.**

German Practice in Flexible Hot

Following successful test sections, a set of "Technical Directions" was prepared to guide government agencies and contractors, until formal specifications could be developed. Nearly 3,000,000 square yards of base has been built in three years (1955-57) under these directions, which are presented here in abridged form.

By Paul Fluss

Testing Engineer, San Francisco Port Authority

UNTIL a few years ago, hot mixed asphalt bases were not used in Germany; this despite available reports from abroad, especially from the United States, describing satisfactory performance and economy of this type of construction. More recently test roads have been built in Germany to determine the suitability of this construction in the country's expanding highway program.

A small amount (8,400 sq. yd.) was built at the Lahr test road in 1953. Another section was included in the test road By-Pass Hamburg-Bergedorf in 1954. Two more test sections were built in 1955, one on Federal Highway 209 near Lauenburg the other one on Federal Highway 300 near Augsburg. From a total of about 24,000 sq. yd. by the end of 1955, the use of asphalt bases rose to some 840,000 sq. yd. in 1956 and 3,000,000 sq. yd. by the end of 1957.

This rapid development of a new type of construction, little known in Germany up to a few years ago, is credited to a number of advantages stemming from the combination of flexibility and slab-like effect. These include good pressure distribution on the subgrade, and dampening of traffic shocks; uniform structure without expansion joints; same coefficient of expansion for base as for surface; adjustment to ground movements, such as settlement and frost heaving; good protection against frost damage from above as surface water is kept from entering the subgrade; traffic requirements can be met by varying the number of layers.

Also it was found that the bases can be rolled to meet close evenness tolerances because of use of spreading machines and layered construction. The bases are immediately able to carry traffic as temporary roadway, with possibility of postponing the wearing surface.

Another factor has been the possibility of using various aggregates of different kinds of gradation from local sources. And bases can be placed with machinery normally used in asphalt road building in a high speed, mechanized procedure. Any surface type from seal coats to heavy-duty asphalt concrete, as required by existing traffic, can be applied as a final course, and additional layers added as traffic increases.

Reports and publications about test roads in Germany and subsequent construction projects as well as a prepared set of "Technical Directions," have been used by contracting agencies and contractors, due to the lack of appropriate specifications.

The following excerpts are taken from "Technical Directions" issued by the Asphalt Department of Esso, A. G., in Hamburg, Germany, which are partly based on experiences and test methods used in the United States.

TECHNICAL DIRECTIONS

Selection of Material. The prerequisite for an economical and technically good construction of hot-mixed asphalt bases is the local availability of suitable gravels or sands in sufficient quantities. A graded material should be preferred to a fine single-size sand, as gravel or gravel sand mostly give better mixes, even without any appreciable additions. Sizes retained on the 1½-in. sieve have to be removed from a gravelly material. Small amounts of loamy material may be present in finely divided form, but

● Placing of first layer of asphalt gravel base (2 in.)

Mixed Asphalt Bases

not as lumps. A pit material containing such a portion may be better than a clean washed aggregate without any fines.

In each case the decision of which material is the best, can only be made by testing it in the laboratory.

Construction Details. The required thickness of the asphalt base as well as the total thickness of the pavement structure, including wearing surface, depends on the condition of the subgrade and the traffic load. The following values can be used for the thickness of asphalt bases, provided the subgrade is well densified and stable:

Highways with heavy truck traffic (Autobahnen, Federal and State Highways)	min. 6 in.
Road with medium or light traffic and occasional heavy traffic (Secondary highways, county roads, etc.)	min. 4 in.
Minor roads and sidewalks, etc.	min. 2 in.

Due to their plastic behavior, asphalt bases always require headers (curbs) for heavy traffic. For lighter traffic, the asphalt base can be extended 1½ ft. on each side of the roadbed.

TESTING OF AGGREGATES AND MIXTURES

I. Aggregates

(a) Sands. For asphalt sand bases, fine, medium and coarse sands up to 5 mm (No. 4 sieve) can be used. The sand should have an adequate distribution of particle sizes. If several sands are available, a sieve analysis will determine the choice.

If the sieve analysis is unfavorable, it is sufficient in many cases to mix sands of different sizes to arrive at a better grading. Should this not be possible, stone dust or manufactured sand (crushed or ground) must be added.

Besides the gradation, the shape and surface characteristics are of considerable importance affecting the suitability of sands.

But only the stability values, established by laboratory tests, are decisive for the determination whether a specific sand deposit with the necessary modifications or additions of other aggregates can be used.

Gravel sand mixes are much denser than pure sand mixtures. Therefore, it is not difficult to arrive at a void content of less than 22% volume, as it is specified in DIN (German Industry Standard) 1996 for asphaltic concrete mixes.

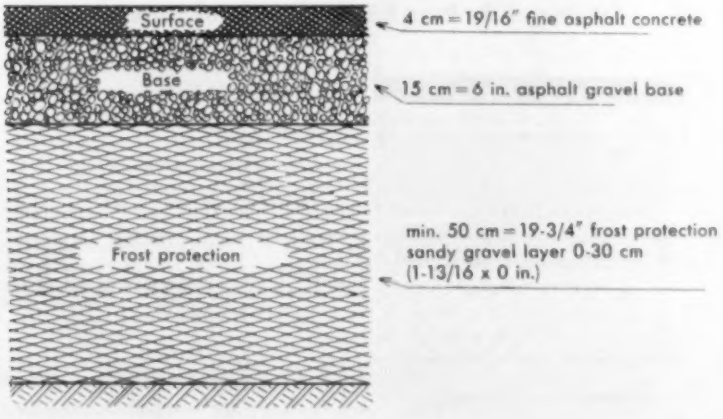
To judge aggregate mixtures for asphalt bases, the following expedients may be used:

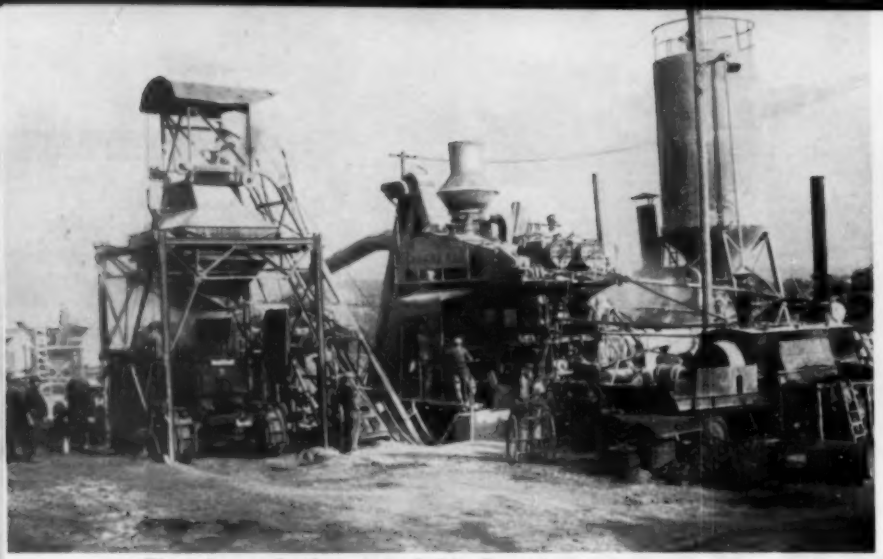
(1) Plotting the grading on the Rothfuchs chart, where the sieve diameters are arranged at the root scale. In this chart, the straight line represents the densest aggregate combination.

The closer the curve approaches this ideal line, the better Marshall and Hubbard-Field stabilities are to be expected.

(2) Determination of the uniformity coefficient which is also a

Section of State Highway 380 Near Nievenheim


Surface
Base
Frost protection
4 cm = 19/16" fine asphalt concrete
15 cm = 6 in. asphalt gravel base
min. 50 cm = 19-3/4" frost protection
sandy gravel layer 0-30 cm
(1-13/16 x 0 in.)



● **Plant for production of Asphaltic Concrete.**

measure of the denseness of the aggregate mixture. The uniformity coefficient is the proportion of the sieve diameter at which 60% are finer to the sieve diameter at which 10% are finer.

Efforts should be made to attain a uniformity coefficient of at least 7.

II. Composition and Testing of Asphalt-Aggregate Mixtures

Having established the most favorable aggregate combination the proper grade of asphalt has to be selected and the correct amount of asphalt determined by laboratory experiments.

Normally, penetration 70-100 asphalt is to be considered for bases; for asphalt-sand bases in special cases, penetration 50-70. Penetration 160-210 can be used for asphalt gravel bases, if the gradation is especially favorable.

The quantity of asphalt to be used is based on the actual requirement of the mixtures, having regard to the void content of the compacted test specimen and the minimum demands for stability.

Decisive is the determination of stability properties of the asphalt aggregate mixtures. Since the DIN 1996 does not include any suitable stability tests for this purpose, it was necessary to fall back on American test methods. From these, the procedures by Hubbard-Field and Marshall are to be considered. The stability established in accordance with these methods is a measure of the resistance of asphalt bases to plastic deformation. It shall not be below certain minimum values, *but also shall not exceed an upper limit.*

In certain cases, it will be necessary to perform a swell test of the mixture.

III. Requisite Properties of Asphalt Bases

According to recent experiences and having regard to American specifications, certain requirements for the quality of mixtures for asphalt bases can be established. These can assist in judging such mixtures and serve as tentative directives. Most advantageous appears to be the method according to F. N. Hveem, which takes only 24 hours.

In Table 1, the requirements for asphalt bases using sand mixtures are enumerated.

The requirements regarding the Marshall method are based on American values, established by experience. The data on the minimum bulk density are based on German experiences with such mixtures.

The requirements for the qualities of hot mixed asphalt bases, using gravels, are contained in Table 2.

Regarding the mechanical properties, the same minimum requirements as for sand mixtures are valid. To avoid the use of mixtures which are too rich, a minimum void content is stated.

Principally it is to be noted that the given numerical values for stability are minimum requirements which shall be met. But on the other hand, mixtures having excessively high stability must not be considered to be of especially high quality. On the contrary, high stability values may characterize brittle and not so flexible mixtures —thus, for asphalt bases, less suitable.

The following has to be said regarding these technical directions:

(1) To test sands and gravels for relative proportions of detrimental fine dust or clay-like material, the Sand Equivalent Test and Cleanness Test (former Sedimentation Test), as developed and used by the California Division of Highways, are much simpler and, above all, more expedient.

(2) Reports from Germany, based on recent experiences, indicate that the gradation of local materials is not so important as the determination of the right amount of asphalt.

(3) In many cases, about 5% limestone dust is sufficient to arrive at the minimum stability of 300 kg (660 lb.). It is almost more economical to use the more expensive limestone dust instead of split or gravel fines, because small amounts are sufficient to improve the stability. Also, manufactured sand has a good effect on the stability, especially when it contains a high percentage of filler.

(4) The consensus in Germany is that hot plant mixed flexible bases are to be preferred to any

Section of By-Pass Billstedt (Federal Highways)

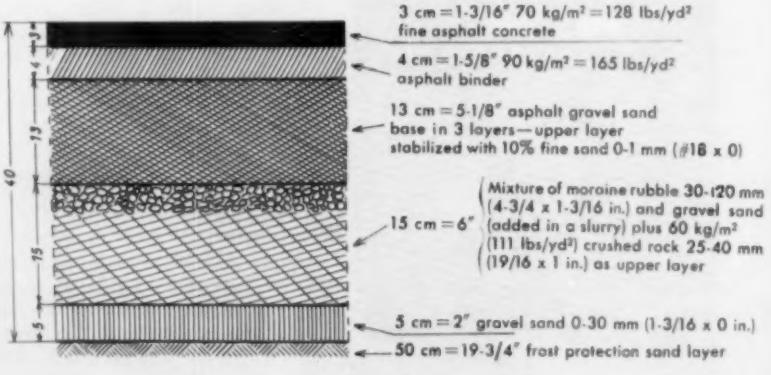

3 cm = 1-3/16" 70 kg/m² = 128 lbs/yd²
fine asphalt concrete
4 cm = 1-5/8" 90 kg/m² = 165 lbs/yd²
asphalt binder
13 cm = 5-1/8" asphalt gravel sand
base in 3 layers—upper layer
stabilized with 10% fine sand 0-1 mm (#18 x 0)
15 cm = 6"
Mixture of moraine rubble 30-120 mm
(4-3/4 x 1-3/16 in.) and gravel sand
(added in a slurry) plus 60 kg/m²
(111 lbs/yd²) crushed rock 25-40 mm
(19/16 x 1 in.) as upper layer
5 cm = 2" gravel sand 0-30 mm (1-3/16 x 0 in.)
50 cm = 19-3/4" frost protection sand layer
40
3
4
13
15
5
5

Table 1—Using Sands (Sand Asphalt)

Type of Traffic	Light to Medium	Heavy
Hubbard-Field Stability:		
(a) 2" apparatus kg. min.	320	360
(b) 6" apparatus kg. min.	320	500
Marshall Method:		
Stability test kg. min.	150	225
Flow test 1/10 mm. max.	50	50
Bulk density—min.	1.90	2.00

Table 2—Using Gravel (Gravel Asphalt)

Type of Traffic	Light to Medium	Heavy
Hubbard-Field stability:		
6" apparatus—kg. min.	320	500
Marshall method:		
Stability—kg. min.	150	225
Flow test—1/10 mm. max.	50	50
Bulk density—min.	2.00	2.10
Voids—vol. % min.	2	2

road mixed material for the following reasons:

(a) Homogeneous mixture and even distribution of the asphalt.

(b) Uniform depth of the base.

(c) Less vulnerability to wet weather.

(d) Minimum delay in reopening road for traffic.

(5) While concrete strip headers are specified for Autobahnen and Federal highways, many other highway and road projects in Germany were constructed by extending the asphalt base on each side of the roadbed and beveling it off.

It is self-evident that the locally available material determines the most economical type of asphalt base. In southern Germany and especially Bavaria, predominantly asphalt gravel bases have been built due to the abundance of local pit gravels and gravel sands. It is reported that about 420,000 sq. yd. of asphalt bases, approximately 6 in. thick on Federal highways and 4-6 in. thick on State highways, using gravel sand, have been constructed. Depending on traffic requirements they received either a binder and fine asphalt concrete surface course or only the latter.

Dr. Ing. W. Grossjohann, Krefeld reports a project near Cologne where gravel was used containing a high percentage of sand, only 30% of material was retained on the 2 mm (No. 10) sieve and 0.1 to 0.4% passing the 0.09 (No. 170) sieve. For the 15 cm (about 6 in.) asphalt gravel base, built in three layers, the material was used in the following combination:

95% sandy gravel 0-30 mm ($1\frac{3}{10}$ x 0 in.)

7% limestone dust plus

4½-5% asphalt penetration 70-100

The aggregate combination had the following grading:

Sieve Size mm	Closest U. S. Sieve	Percent Passing
30	$1\frac{3}{16}$ in.	100
18	¾ in.	97.4
12	½ in.	93.0
8	$\frac{5}{16}$ in.	87.8
5	No. 4	82.3
2	No. 10	74.7
0.6	No. 30	60.5
0.2	No. 70	14.9
0.09	No. 170	7.5

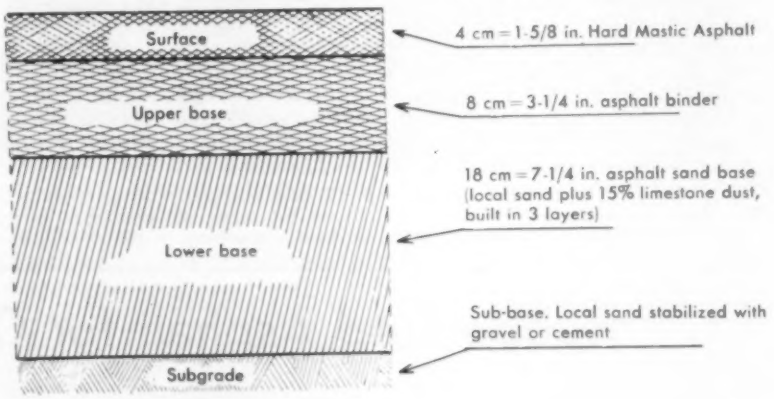
The Hubbard-Field Stability of the asphalt gravel base was 1050 kg (2,315 lb.).

The wearing surface was placed right on the asphalt gravel base without binder and consisted of 4 cm ($1\frac{9}{16}$ in.) fine asphalt concrete containing limestone aggregate up to 12 mm (½ in.).

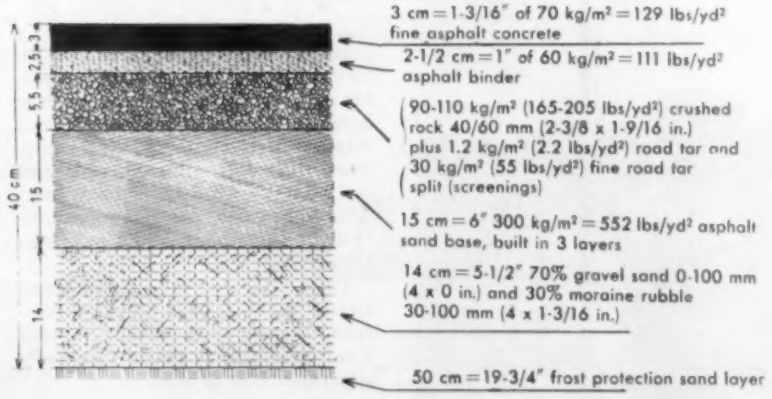
In the northern German flat lands, conditions are different. Only natural sands, more or less fine moraine rubble and limited quantities of coarse moraine material are available. For this reason, Oberbaurat Klaus Beckmann, of Hamburg, states:

"Because of the good experience with the asphalt base at the By-Pass Hamburg-Bergedorf, the development of asphalt bases using local materials was continued. This could be justified as the favorable experiences covered two summers and three winters of observation of a heavily traveled highway—10,000 vehicles in 24 hours; 40% trucks and, of these 40% very heavy

Cross Section of Berlin Expressway Ring


Surface
Upper base
Lower base
Subgrade
4 cm = 1-5/8 in. Hard Mastic Asphalt
8 cm = 3-1/4 in. asphalt binder
18 cm = 7-1/4 in. asphalt sand base (local sand plus 15% limestone dust, built in 3 layers)
Sub-base. Local sand stabilized with gravel or cement

Section of Traffic Junction Sechlingsforte


3 cm = 1-3/16" of 70 kg/m² = 129 lbs/yd² fine asphalt concrete
2-1/2 cm = 1" of 60 kg/m² = 111 lbs/yd² asphalt binder
90-110 kg/m² (165-205 lbs/yd²) crushed rock 40/60 mm (2-3/8 x 1-9/16 in.) plus 1.2 kg/m² (2.2 lbs/yd²) road tar and 30 kg/m² (55 lbs/yd²) fine road tar split (screenings)
15 cm = 6" 300 kg/m² = 552 lbs/yd² asphalt sand base, built in 3 layers
14 cm = 5-1/2" 70% gravel sand 0-100 mm (4 x 0 in.) and 30% moraine rubble 30-100 mm (4 x 1-3/16 in.)
50 cm = 19-3/4" frost protection sand layer
40 cm
5.5 - 2.5 + 3
15
14

● Federal highway 54 near Wiesbaden. Machine placing of asphalt gravel base.

trucks. Moreover, the road has a slope 1:33 and runs in a southeasterly direction, thus being exposed to strong sun rays. It is in perfect condition; the surface is completely level and without any cracks."

One project described by Beckmann is the By-Pass Billstedt (Federal Highway 5).

This highway is built mostly on former marshland. On this project also a 50 cm (19¾ in.) frost protection layer of fine round sand was placed on the soil. To stabilize it, it was followed by a 5 cm (2 in.) layer of gravel sand 9-30 mm ($\frac{3}{16}$ in. max.) containing some fines, which was compacted by vibration using special equipment. The next course was a 15 cm (about 6 in.) subbase consisting of a mixture of moraine rubble 30-120 mm (1¾ to $1\frac{3}{16}$ in.) and gravel sand, which was added in a slurry. The upper layer of the subbase was improved by addition of 60 kg/m² (111 lb. yd.²) crushed rock 25-40 mm ($1\frac{9}{16}$ to 1 in.). The base course consisted of 13 cm (5⅛ in.) depth of gravel sand mixture conforming to grading curve F of DIN-1045, containing 5½% asphalt, penetration 70-100. It was built in three layers and the upper layer was stabilized by adding 10% fine dune sand (filler).

The Hubbard-Field stability values 15 cm, 60° C. (6 in., 140° F.) were between 450 and 700 kg (992-1543 lb.). The use and development of asphaltic concrete bases in Germany during the past several years is certainly worthy of note. The facts presented are based on personal contacts and correspondence and translations from articles in German technical periodicals.

Rubberized Asphalt for Old Bridge Deck

A RUBBERIZED ASPHALT paving mix recently placed on Akron's North Hill Viaduct is designed to give a smooth, long-lasting road surface requiring little maintenance.

The four-lane, 4,000-ft. bridge opened in 1922, is the main artery from downtown Akron to the north and Cleveland. The entire resurfacing job was accomplished in three working days and traffic maintained at all times, including rush hours.

Paving used on the bridge was hot mix asphalt, rubberized by the addition of Rubarite, a fine synthetic rubber powder specially developed by Goodyear for paving applications. Approximately 1,300 tons of asphaltic hot mix, including 6.5 tons of Rubarite were used. Content of rubber, as Rubarite, in the mix was 3 percent by weight of the asphalt. The mix was designed for the high flexibility with high stability required by movement of the bridge deck.

A particular problem in the resurfacing job was posed by movable, steel plate expansion joints.

These plates, by their movement, in some places had forced the previous pavement up as much as 3 in., creating an extremely rough, uneven surface. Prior to the resurfacing, these humps were removed down to the plates. A light scratch coat or leveling course was then applied, followed by a 1-in. thick surfacing of rubberized asphalt hot mix.

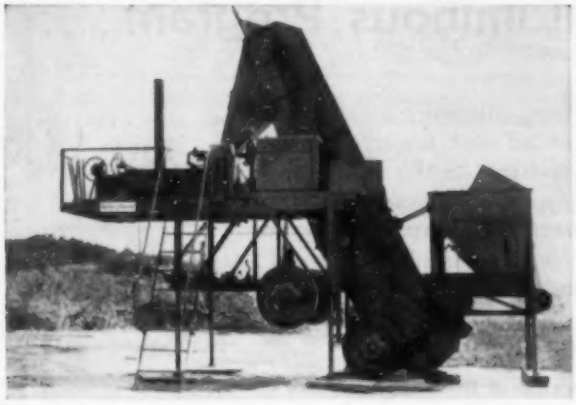
● Placing the rubberized asphalt mix on the bridge at Akron.

The makers of Rubarite report the belief that use of this material on the project simplified the paving operation, particularly in regard to rolling over the expansion plate. Consistency of the mix, resulting from the addition of the rubber powder, was such that at no time did the mix tend to be pushed up or ahead of the rollers as they passed over the steel expansion plates. The result is a smooth, even roadbed.

Use of Rubarite in asphalt paving mixes is designed to give a longer lasting road surface more uniform in texture and more flexible at low temperatures. Such mixes have high adhesive strength and retain their elasticity. To date, more than 160 miles of roads and city streets in the U. S. have been resurfaced with paving mixes utilizing this rubber additive, notes Goodyear.

Contractor for the bridge resurfacing job was Thorpe Construction Company, of Akron, Summit County engineer Leslie G. Wolfe supervised the project.

Start with an asphalt plant that can grow with your business



Begin with a mixer, elevator and hopper, and you're set to produce stabilized and cold bituminous mixes at capacities of more than 50 t.p.h. For a low initial investment, the Barber-Greene 840-B gives you big plant features and flexibility.

Later add a dryer to produce hot mixes (to 45 t.p.h.) suitable for nearly every type of paving job. With an aggregate feeder to control cold feed gradation, the complete range of hot mixes can be produced—except specs requiring screening after drying.

For high type mixes, expand operations with a gradation unit to produce mixes (to 45 t.p.h.) to meet any specification. A complete line of dust collectors, cold feeders, mineral feeders is available to meet all of your requirements.

Get big plant features with the low cost Model 840-B. A new, longer twin shaft pugmill, hydraulically operated pugmill discharge hopper, interlocked proportioning, speedy setup, unexcelled portability—all provide more production and profit.

56-5-A

Barber-Greene BG

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CONVEYORS . . . LOADERS . . . DITCHERS . . . ASPHALT PAVING EQUIPMENT

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Observations on

Minnesota's 1957 Bituminous Program

Pneumatic rolling of hot mix layers, following break-down with steel rollers, was required on all state projects during the 1957 season. Herewith are comments on this innovation and other practices, as part of the state's annual review of bituminous work, published for the department staff as Technical Information Bulletin No. 35 of the Materials and Research Division.

By J. A. Murchie

Bituminous Engineer, Division of Materials & Research, Minnesota Department of Highways, St. Paul

BITUMINOUS CONSTRUCTION in Minnesota's 1957 state highway program consisted of the mileages shown in Table I broken down according to the types. The bituminous materials totaled 35,607,404 gal. The types of materials used are shown in Table II.

● *Hot Mix Production.* Table III shows the distribution of the hot-mix production for the 1957 construction season. Seven of the plants used were batch-type; and the other 21 continuous-type. One contractor produced 108,283 tons of Spec. 2351 hot asphaltic concrete mixture, using one continuous-type mixing plant.

Plant mixtures were produced throughout nearly 8 months, as follows: May, 33,950 tons (3.4%), November, 36,460 (3.6%), December, 677 tons (0.07%), the balance about equally divided among the five summer and autumn months.

A comparison of the hot plant-mix production with previous years is shown in Chart I, and a comparison of the yearly carry-over tonnage is shown in Chart II.

● *Compaction of Bituminous Hot-Plant Mixtures.* During the 1957 construction season, the specifications for compacting of hot mixes was changed to require the use of self-propelled pneumatic-tired rollers. Contracts required that, "The initial rolling shall be done with a steel wheeled roller. The surface shall then be rolled with a self-propelled pneumatic-tired roller which exerts a pressure of not less than 200 psi of rolling width, until there is no further evidence of compaction."

Very few of the contractors or inspection personnel had previous experience with this type of operation, and considerable experimentation took place before a standard procedure was established. It was determined that in general it is good practice to do the pneumatic rolling as early as possible to take advantage of the plastic condition of the mix at higher temperatures.

When the mat is soft the speed of the roller should be held down to less than 3 mph. and the roller kept in constant motion. As the mix cools, or as the density is increased, the speed of the roller can be increased. Rollers have been operated at speeds above the 5 mph permitted and have been observed to develop a rhythmic bounce which causes high-speed roughness in the final surface.

The use of the pneumatic-tired roller has so far shown evidence of serving two useful purposes. First, it develops an early traffic seal over the entire width of mat, which closes the porous surface and will thus help retard weathering of the bitumen. Second, it is possible to correct some of the disadvantages of steel wheeled rolling, such as shoving and cracking of freshly

TABLE I

Miles of Construction in Minnesota During 1957

Type of Construction	State Const. Div.	State Maint. Div. Contract	State Maint. Div. State Forces	Counties FAS	Total
Spec. 2351 (Hot Asphaltic Concrete)	36.1	1.3	—	—	37.4
Spec. 2341 (Hot Plant Mix Surface)	86.8	—	—	1.3	88.1
Spec. 2331 (Single Aggregate Mix)	273.4	17.3	—	54.8	345.5
Spec. 2321 (Road Mix Surface)	42.5	114.9	277.8	427.5	862.7
Spec. 2208 (Road Mixed Bit. Base)	229.1	32.0	—	123.5	384.6
Spec. 2356 (Bit. Seal Coat)	5.3	431.7	—	32.8	469.8
Spec. 2357 (Light Bit. Seal Coat)	10.3	454.5	29.3	68.0	562.1
Spec. 2358 (Double Bit. Seal Coat)	—	0.6	0.1	—	0.7
Fog Seal (RT)	19.8	4.3	3.5	0.7	28.3
All Hot Mixes	392.8	18.6	—	56.1	467.5
All Road Mixes	150.1	114.9	277.8	524.6	1067.4
Seal Coat Only	3.3	879.1	29.4	47.6	959.4
Total Mileage	546.2	1012.6	307.2	628.3	2494.3

TABLE II
Tonnage of Bituminous Materials in 1957 Program, By Grades

	AC	SC	MC	RC	RS	SS	RT
Construction Division	10,559,529	—	3,747,549	51,373	196,945	884,363	11,716
Maintenance (Contract)	497,647	593,222	2,075,619	1,575,524	923,963	—	135,097
Maintenance Forces	—	873,033	2,066,961	145,073	21,527	—	360,254
County FAS	1,066,324	597,291	8,864,639	357,855	—	—	1,900
Total	12,123,500	2,063,546	16,754,768	2,129,825	1,142,435	844,363	508,967

Note: The material listed under AC (including 454 tons of SC-5) was contracted for on a tonnage basis (51,517 tons) and is shown in the table as gallons for convenience. The RC material listed under County FAS includes 207,267 gal. of RCS.

TABLE III
How 1957 Season's Bituminous Work Was Divided Up

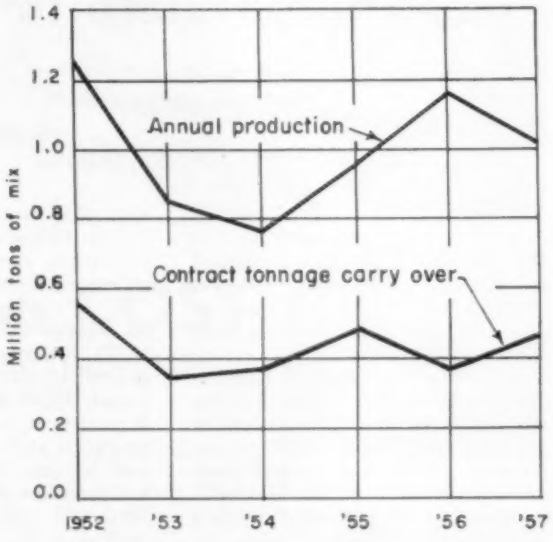
Mix Spec.	Tons	Miles	No. of Contractors	No. of Plants	Hours Worked	Average Tons/Hr.
2351	190,987	37.4	8	8	24,804	77
2341	284,815	88.1	12	15	38,489	74
2331	532,941	345.5	15	17	56,696	94
All	1,008,743	467.5	22	28	119,989	84

TABLE IV
Density of Constructed Surfaces

Mix Spec.	% of Laboratory Density Obtained		
	Ave.	Low	High
2351 (hot asph. conc.)	97	94	101
2341 (hot plant mix)	95	92	99
2331 (hot plant mix)	93	89	99

TABLE V
Voids in Constructed Surfaces

Mix Spec.	% Voids in Compacted Pavement			
	Ave.	Low	High	Lab. Range
2351	7	3	10	3 to 5
2341	9	6	12	3 to 7
2331	13	5	15	2 to 8



constructed surfaces.

Practically all of the self-propelled pneumatic-tired rollers used were of the 9-ton, 9-wheel type, using smooth 4-ply 7:50 x 15 tires carrying 35 psi pressure. Since these tires exert a lighter contact pressure than the tires of the heavier trucks to which the road will be subjected, it is possible that some further consolidation in the wheel tracks may result.

● *Characteristics of Compacted Mixtures.* The density of the layers thus constructed was determined at the highway department's laboratory using samples obtained on the job site by a laboratory representative. Test results were compared with the densities developed during the trial mix analysis for the project, and reported as a percentage of the laboratory density.

It should be pointed out that the laboratory uses, for a basis of comparison, a kneading compactor which generally develops a higher density than the Marshall compaction method used by many other agencies. This density increase is in the range of 1% to 5%, or 1 to 8 lb. per cu. ft.

Table IV summarizes the comparative densities of the constructed surfaces on all projects.

All of the samples tested were taken at a distance of 16 in. from the outer edge of the mat; previous studies have indicated that the least compactive effort is applied at this point.

The void content of the constructed surfaces is determined from the field density samples and is relatively uniform for each type of mixture, as shown in Table V. The difference between the laboratory void content and the void content of the constructed surface is principally due to the difference in the densities to which the mixtures are compacted.

● *Seal Coats.* During the seal coat construction season, June 1 to September 15, some 1,028 miles of road were sealed. Of this amount 476 miles consisted of heavy seal coat construction using approximately 0.24 gal. per sq. yd. of liquid bituminous material, with a cover of 22 lb. per sq. yd. of ½-in. max. to No. 10 aggregate.

Some of the heavy seal coats were not satisfactory and resulted in unsightly surfaces. In addition to the seals constructed in the 1957 season, three sections constructed in previous years became slippery during

the year. Two basic conditions are considered responsible for such unsatisfactory results:

1. Aggregate gradation. The wide range in particle sizes, permitted under the specifications in past years, presented a difficult problem in determining the proper amount of bituminous material to be applied, to obtain adequate retention of the larger particles (over 3/8 in.) without inundating the smaller sizes.

As a result, the bituminous application was sometimes reduced to a quantity that would hold only the medium-size particles, while the coarser particles were whipped off under traffic. This caused the seal coat to bleed for lack of sufficient cover aggregate, or because most of the retained smaller aggregate particles became submerged in the asphalt film. On rural roads with high volume and high-speed traffic, the seal coat deterioration may be very rapid.

2. The summer of 1957 was unusually wet and humid, with fewer than normal days suited to successful seal coat construction. The high humidity extended the curing time of the liquid bituminous material beyond that normally anticipated. In many cases traffic was permitted unrestricted use of the freshly constructed seal coat, before the bituminous material had cured sufficiently to securely bond the aggregate in place.

The difficulties encountered on heavy seal coat construction on heavy traffic roads has resulted in major revisions of the construction and aggregate specifications. Traffic, humidity and road surface provisions have been changed. The cover aggregate sizes have been restricted to single sizes with all of the particles to be smaller than the No. 3 (1/4 in.) sieve.

During the year 551 miles of light seal coat were constructed with generally good results.

Washington State to Rate Plant-Mix Projects

Contractors and resident engineers on best controlled projects will receive awards, as part of unique plan to stir interest in quality work.

IMPROVING THE QUALITY of asphalt paving on a state-wide basis is the purpose of a plan developed recently by the Washington state department of highways in cooperation with the Asphalt Paving Association of Washington.

According to Carl V. Kilgore, executive secretary of the Association, the plan involves a system of rating plant-mixed asphalt paving projects, to determine the best project completed in 1958 and subsequent years in each of the state's seven highway districts. Also, appropriate awards will be made to the paving contractors and resident engineers responsible for the winning projects. The ratings give equal consideration to small and large projects.

In announcing the program in behalf of the highway department, director W. A. Bugge said, "It has been our observation that our better asphalt plant-mix paving projects show the results of careful attention to small details of the work. They reflect credit upon good workmanship on the part of the contractor and good inspection practices on the part of our engineers.

"We believe, as do the asphalt paving contractors," Bugge continued, "that a rating system will stimulate interest in all features of paving work by calling attention to some phases of the work which are sometimes overlooked."

The following features of work will come under consideration in rating each project:

(1) Pavement smoothness. Based on roughometer test results.

(2) Roadway finish. Based on general appearance of roadway and slopes, appearance and uniformity of pavement, texture and joints, appearance and efficiency of ditches and drainage structures, alignment and neatness of pavement, appearance and condition of pit sites, stockpiles, etc., upon completion of the work.

(3) Inspection and control of materials. Based on compliance with instructions concerning sampling and daily reports, correlation of field results with headquarters laboratory results, uniformity of control (stability, cohesion, asphalt content, gradation, and fracture).

(4) Safety. Based on accident record and safety precautions of contractors and engineers.

(5) Traffic control. Based on project signing, number of complaints, general handling of traffic through project.

(6) Prosecution and progress. Based on promptness in beginning work, organization of work, quality of supervision, sufficiency and condition of equipment placed on job, time required for completion.

(7) Field inspection costs. Based on salary costs of inspectors, checkers, weighman, etc.

(8) Complexity of project. Based on number of complicating factors affecting the work, such as interchanges, high traffic volumes, etc.

As can be seen in the description of the rating system above, both the contractors and engineers must perform top quality work for a project to receive a high rating.

Although the interest and support of contractors is considered vital to the success of the plan, the contractors will be allowed no voice in rating or selection of winning projects. Rating of projects will be initiated in each district and will be completed in the headquarters office. Announcement of the winning projects will be made early in the year following each construction season.

ACCIDENT FACTS. This well-known data yearbook has been published in its 1958 edition by the National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.

It contains facts and figures on all types of accidents—industrial, traffic, motor transportation, home, farm and school. Sections cover occupational accidents, and provide a comprehensive background for an organization safety program. Further information including quantity prices for the booklet may be obtained from the Safety Council.

New Products

(Continued from page 120)

Self-Propelled Excavator

A new spring-mounted oscillating front axle is standard on the 3/8-yd Lorain self-propelled Model SP-107. This new design is stated to allow the front wheels to hug the ground so the 4-wheel drive can apply the tractive effort necessary to carry this rubber-tire excavator over the rough, soft ground of off-the-highway construction sites.

When maximum crane lifting capacities are needed, the front spring action can be "locked-out" easily, to give solid-axle, full 7-ton capacity over front, rear and sides without setting outriggers.

The Thew-Lorain Co., Lorain, Ohio.

Lorain Model SP-107 Excavator

For more details circle 140 on Enclosed Return Postal Card.

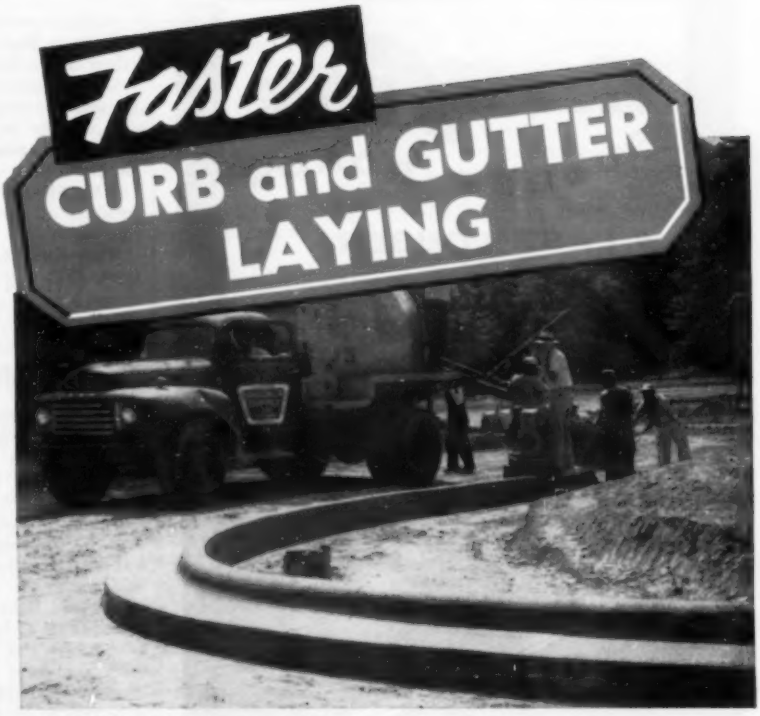
Plaster-Mortar Mixer

A new 6 cu. ft. capacity plaster-mortar-terrazzo mixer, the Kwik-Mix "Standard" is now in production. Available as a tilt or non-tilt model, the 6-PM has an all-welded carbon steel drum with a 30-in. charging opening. Charging height is 46½ in.

Kwik-Mix Co., Port Washington, Wisc.

Non-Tilt Model 6-PM "Standard" Mixer

For more details circle 141 on Enclosed Return Postal Card.



Smith-Field Automatic Curb and Gutter Machine in operation.

at LESS COST

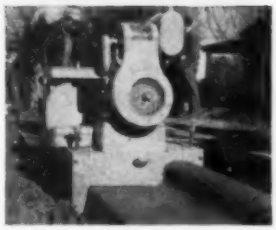
NO HAND FINISHING!
NO FORMS!

Lay up to 1,200 feet of integral curb and gutter per day — with no forms or hand finishing. The Smith-Field Automatic Curb and Gutter Machine is doing just that for cities, contractors, builders over the world. Savings of time, labor and material mean money on any job anywhere. The Companion machine — Stephens-Canfield Automatic Curber — lays curbing with the same dispatch, reaching as high as 3,000 feet per day.

The Smith-Field Automatic Curb and Gutter Machine uses Portland Cement Concrete. The Stephens-Canfield Automatic Curbers work equally well with either cement or asphalt mix.

TYPICAL MOLD SECTIONS—65 OTHERS AVAILABLE

LEARN about the savings — the efficiency of these machines. Write for full details and prices.



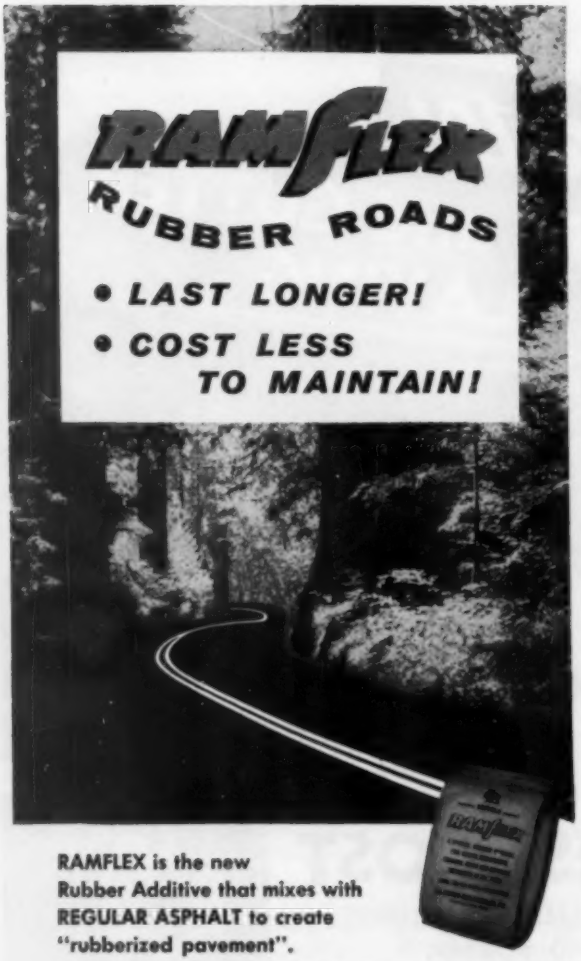
Smith-Field Automatic Curb and Gutter Machine — Model Mark 4

Stephens-Canfield Automatic Offset Curber — Model 56W

Stephens-Canfield Automatic Curber — Model 55A

E. L. HARDIN ASSOCIATES, INC.
SALISBURY, NORTH CAROLINA U. S. A.

. . . for more details circle 277 on enclosed return postal card



RAMFLEX is the new Rubber Additive that mixes with REGULAR ASPHALT to create "rubberized pavement".

RAMFLEX requires no special equipment and the paving mixture spreads rapidly, evenly and uniformly. The paving won't "shove" after placed, resists cracking in cold temperatures, and "bleeding" in hot weather. Stripping and raveling of road edges is reduced to a minimum. In addition, hot patches last far longer when made with RAMFLEX. This all means lower paving costs and practically NO maintenance.

All these advantages have been PROVED on successful state, county, city and private paving installations. Why don't you be the one to introduce the revolutionary new RAMFLEX Rubber Road to your local paving program. Regular contractors do the paving . . . we supply the RAMFLEX in convenient size bags. Write for the money saving facts, today.

Send for this illustrated

FACT FOLDER

Every paving contractor, every government official connected with paving programs should read this informative folder.

U.S.

RUBBER RECLAIMING CO., INC.

P. O. BOX 365 BUFFALO 5, NEW YORK

. . . for more details circle 315 on enclosed return postal card

Finishing Screed

A new, quickly adjustable concrete finishing screed, available from Blaw-Knox Co., is designed to speed rigidly specified crown finishing on highway and airport paving projects: For use with the firm's Model XE concrete paving finisher the new job-tested screed features:

1. Simple cam adjustments to produce over 18 crowns.
2. Good crown to flat to crown transition for continuous, rapid finisher operation.

This Model 5M screed, according to the company, will produce all symmetrical crowns without a change of internal parts.

Blaw-Knox Co., Construction Equipment Division, Mattoon, Ill.

For more details circle 142 on Enclosed Return Postal Card.

New Welding Electrode

A new electrode for manual application called "Stoody Build-Up (Iron Powder Coating)" with a deposition rate of better than 6 lb per hour at 250 amps has just been announced by Stoody Company. Operating either AC or DC (either polarity) weldability is stated to be excellent, efficiency remarkably high, and spatter loss low. The rod may be applied in either stringer beads or wash passes; build-up is unusually high with good penetration of the base metal.

A 2-pass weaved deposit on medium carbon steel shows a Rockwell C hardness of 26; stringer beads on the same base metal give a reading of Rockwell C 33. Deposits are subject to heat treatment; water quenching from 1600° F increases hardness to Rockwell C 44. The work hardens only two or three points. High tensile strength, resistance to cold flowing under compressive load, high impact strength, low tendency to work hardening, and limited increase in hardness under severe quench are noted as characteristics.

Stoody Company, Whittier, Calif.

For more details circle 143 on Enclosed Return Postal Card.

Jaw Crusher

A new jaw crusher in the 20 in. x 36 in. size has been placed on the market by Pioneer Engineering, Division of Poor & Company. Termed the "2036", this new crusher is of the overhead eccentric type.

The crusher has a longer jaw than former models for improved angle of nip to reduce "belching". It is hydraulically adjusted for setting to produce materials down to 2½ or 3 in. minus, and has a rated capacity under average crushing of 190 to 200 tons an hour of 6-in. minus product. Rated capacity is 95 to 100 tons an hour of 3 in.-minus product under similar crushing condition.

Pioneer Engineering Division, 3200 Como Avenue Southeast, Minneapolis 14, Minn.

For more details circle 144 on Enclosed Return Postal Card.

2-Way Pocket Size Radio

A new pocket-size, two-way radio has been placed on the market by RCA. The unit, which can be clipped to a belt or carried in a pocket, comprises a 10-oz. transistorized receiver and a 28-oz. transmitter, and has a range up to two miles in communication with mobile units or even longer with fixed stations.

The receiver measures 6½ in. in its largest dimension. Power is supplied by a single small battery with a life of 150 hours.

Radio Corporation of America, 30 Rockefeller Plaza, New York 20, N.Y.

For more details circle 145 on Enclosed Return Postal Card.

1½-Yard Shovel

A new 1½-yd. shovel has been added to the line of Manitowoc Engineering Corp. The new unit, the Model 2300, is easily converted to 1½-yd. clamshell or trench hoe, 1½-2½-yd. dragline or 35-ton crane.

One of the many completely new features is the easy hydraulic jack adjustment of the crawler drive. This feature is patterned after "big machine" design to assure even crawler tension at all times.

Also featured is the new flat-designed 62-in. roller path which allows more precise adjustment between the house rollers and the king pin to minimize king pin strain.

Manitowoc Engineering Corp., Manitowoc, Wisc.

Manitowoc Model 2300 1½-yd. Shovel

For more details circle 146 on Enclosed Return Postal Card.

Ripper Points

A new point design, developed by Electric Steel Foundry Co., is claimed to offer excellent penetration and long life in such tough formations as hard pan and tight river bottom gravel. This new product, called the RDX point, was originally developed for ripping applications but is equally effective in bucket and shovel operations. The tapered wear pattern keeps this point exceptionally sharp due to its narrow ribbed design.

Electric Steel Foundry Co., 2141 N.W. 25th Ave., Portland 10, Ore.

RDX Point

For more details circle 147 on Enclosed Return Postal Card.

Medium Heavy Truck

The Reo line of medium heavy duty vehicles has been expanded by the addition of two new basic models. These models, specified as the C-400 and the C-500 series, embrace four completely restyled, "Gold Comet" six-cylinder powered, 4x2 trucks and tractors in each series. The truck versions of these "C" models have a GVW rating range of 23,500 to 33,000 lb., depending upon components. The tractor versions have GCW ratings between 42,000 and 55,000 lb.

Reo Division, The White Motor Co., Lansing, Mich.

For more details circle 148 on Enclosed Return Postal Card.

Traffic Line Removal

A sand scatter control cart has been added to the Cyclone line of traffic line removal equipment. It is designed for use with Cyclone's heavy duty pressure pot. This cart supports the blast hose and sand scatter guard, while directing the sandblast nozzle to the work. The operator has "stop and start" control of the operation, and fatigue is reduced because he works in a normal walking position. The guard prevents sand bounce on nearby vehicles, confines the sand to the immediate area of the line blaster and permits easy sweep-up of the sand for re-use or disposal.

Cyclone Sandblast Equipment Co., 42 Clara St., San Francisco, Calif.

Sand Scatter Control Cart

For more details circle 149 on Enclosed Return Postal Card.

Large Tamping Roller

A new Ferguson-Gebhard tamper here pictured is fitted with a special gooseneck tongue which allows each drum to oscillate independently and allows the roller to be attached to any of the larger 2- or 4-wheel rubber tired tractors – Caterpillar, Allis-Chalmers, LeTourneau, Wooldridge, Euclid and others.

The roller is made in a variety of sizes. Pressures up to 1000 lb. per sq. in. and 4000 lb per ft. of drum length are available. With 2-wheel tractors, the roller will easily turn on a 20 ft.-width of fill. To provide complete oscillation of both drums, the gooseneck tongue revolves freely around the center pin of the roller and is held upright by two heavy cantilever springs. Side movement of the tongue is limited by heavy bumpers on each half of the roller. It is stated that under average conditions, the roller is easily handled at speeds from 5 to 6 miles per hour.

Shovel Supply Co., 4900 Hines Blvd., Dallas Texas.

Ferguson-Gebhard Tamper

For more details circle 150 on Enclosed Return Postal Card.

Trojan Tractor Shovel Equipped With Ottawa Model LX Backhoe

Backhoe-Shovel

The Trojan Division of the Yale & Towne Manufacturing Co., has adapted the Ottawa Model LX backhoe for use on two models of its Trojan tractor shovel line, the 1¼-yd. Model 104 and the 2-yd. Model 154.

The Model LX backhoe has a continuous 190° swing without adjustments, digs to a 12½ ft. depth, and loads into trucks with sideboards as high as 8½ ft. A special 4-point hitch makes it possible to attach the backhoe to the Trojan tractor shovel in only five minutes.

Trojan Division of The Yale & Towne Manufacturing Co., Batavia, N. Y.

For more details circle 151 on Enclosed Return Postal Card.

Tire Pressure "Detective"

A device which flashes a dashboard warning that a dangerous drop in the pressure of a tire has occurred is now being marketed under the name, "Tel-Air." It consists of a sensitive metering unit attached to the hub of each wheel, and connected to the valve stem

Truck Wheel with "Tel-Air" Unit in Place

of either single or dual tires. Metering is pre-set for any desired pressure and a small red dashboard warning light flashes an instantaneous signal if the pressure in any tire drops.

It is stated that the "detective" remains perfectly adjusted year after year. Studies made by the manufacturer have included all types of freight haulers, earth haulers, heavy-equipment movers, on all types of roads and under all types of conditions, and are reported to indicate a 50% saving in tire repair costs.

Tel-Air Corporation, 4250 Harry Hines Blvd., Dallas, Texas.

For more details circle 152 on Enclosed Return Postal Card.

Neo-Transistor Model TR O with "Magic Switch" (in Pencil Ring)

Automatic Flasher Switch

A "Magic Switch" which automatically turns off the Neo-Transistor warning light during daytime has been developed by Neo-Flasher Manufacturing Company and is available on all Neo-Transistor warning lights. Says the company, "The Magic Switch will cut battery costs in half. The flashers automatically remain off during the daylight hours. Formerly the labor cost of turning lights "on" and "off" each day was greater than the battery savings, consequently it was customary to leave them running day and night, thus wasting batteries during daylight hours."

The Model TR O is visible for one mile. It has the exclusive "Snap-out" bulb socket for easy replacement of bulbs, is weatherproof, and operates for 5 months on two lantern batteries.

Neo Flasher Manufacturing Company, 3210 Valhalla Drive, Burbank, Calif.

For more details circle 153 on Enclosed Return Postal Card.

Waterproof Field Books

Engineers' standard-ruled field books and other notebooks are available in impregnated, completely waterproof paper. It is stated that the hardest pencil will make a sharp, clean mark, whether the book is wet or dry.

J. L. Darling Corp., Brown's Point, Tacoma, Wash.

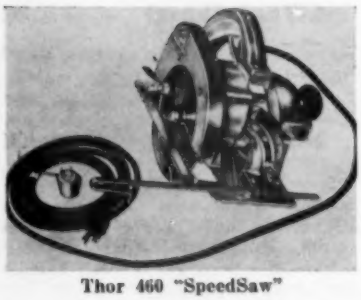
For more details circle 154 on Enclosed Return Postal Card.

Electric Saws

Two electric saws have been added to the portable saw line of Thor Power Tool Co. The new saws are the Thor 485 "SpeedSaw" with 8-in. circular blade and the Thor 460 "SpeedSaw" with 6½-in. blade; both featuring all ballbearing construction.

Powered with a 1¾-hp motor, the 485 saw has a speed of 5,500 rpm for a maximum 45-degree cut of 2 in. and a regular cut of 2 13/16 in. It weighs 14¾ lb. The 460, with a 1¼ hp motor, has a 45-degree cutting depth of 1 11/16 in. and a maximum regular cut of 2 5/16 in. It weighs 10½ lb.

Thor Power Tool Co., Prudential Plaza, Chicago 1, Ill.



Thor 460 "SpeedSaw"

For more details circle 155 on Enclosed Return Postal Card.

Roll Crushers

Two new roll crushers in sizes 24 x 20 and 30 x 24 have been announced by Eagle Crusher Co. Horsepower requirements for the smaller unit is 75 to 125; for the larger unit 100 to 200. Respective weights are 12,000 lb and 16,000 lb.

Rolls are of manganese steel and are furnished either both smooth or both corrugated or one of each. These pressure rolls are turned by steel cut gears running in oil. Heavy-duty, self-aligning, spherical roller bearings carry the loads in these crushers. All welded, heavy plate steel frame houses this newly designed unit.

Eagle Crusher Co., Galion, Ohio.

New Eagle Roll Crusher

For more details circle 156 on Enclosed Return Postal Card.

30-Ton Truck Crane

A new 30-ton truck crane, the Type WT, has been announced by Insley Manufacturing Corporation. It can be supplied with three different truck mountings to meet varying axle load

Insley Type WT Truck Crane

SWENSON SPREADERS
FOR ICE CONTROL

SPREADS SALT 200 LBS. PER MILE
OR IN ANY DESIRED AMOUNT
Lays a Narrow Strip or Full Traffic Lane

Handles all granular materials — salt, cinders, sand, calcium chloride, rock chips. Spreads at speeds up to 30 M.P.H. Clutch-controlled flow: steady or intermittent for hills and intersections.

Write for complete information

SWENSON SPREADER & MFG. CO.
LINDENWOOD, ILLINOIS

. . . for more details circle 308 on enclosed return postal card

requirements. The 30-ton truck carrier is 9 ft wide and the 25-ton truck carrier is offered in both 8 and 9-ft widths.

Total weight of the Type WT rigged as a crane with base boom is: 30-ton 9 ft. wide truck 74,270 lb., 25-ton 8 ft. wide truck 59,250 lb., 25-ton 9 ft. wide truck 62,750 lb. The WT features an 8-ft. wide deck with all operating machinery mounted low and well back of the center line of rotation. Power is transferred from the engine clutch to the operating machinery by a four strand roller chain drive.

Insley Manufacturing Corporation, P.O. Box 167, Indianapolis 6, Ind.

For more details circle 157 on Enclosed Return Postal Card.

"Wedge-Lok" Slide Connector

Form Slide Connector

A new "Wedge-Lok" slide connector added to the line of Clark Industries is stated to enable form strippers to remove any section of curb, gutter, or sidewalk forms without disturbing adjacent units. Each 10-ft. section has three stake pockets, with division plate slots placed at 12-in. intervals. Alignment of stake pockets and bolt holes allows stacking of forms to pour variable depth concrete.

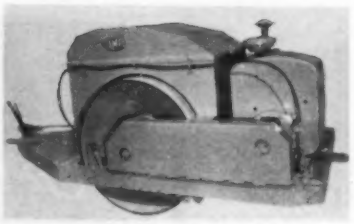
Clark Industries, Construction Equipment Division, 375 East Fifth Ave., Columbus, Ohio.

For more details circle 158 on Enclosed Return Postal Card.

Vibratory Roller

Tampo's new Model C-40 tow-type roller has several innovations that are stated to add to the effectiveness of vibratory compaction.

One important feature is the combination pneumatic and rubber shock mounting which isolates roller frame and tractor from vibratory shock, resulting in smoother performance and preventing damage to frame and couplings. Vibration frequency is variable by throttle setting controlled from operator's seat. Compacting power is stated to range from 30 to 40 tons with a gross weight of only seven tons.



Tampo Model C-40 Tow-Type Roller

Tampo Manufacturing Co., P.O. Box 2340, San Antonio, Texas.

For more details circle 159 on Enclosed Return Postal Card.

Seamless Slump Cone

A new seamless concrete slump cone announced by Soiltest Inc. is made of heavy gauge cadmium plated sheet steel and is of a one piece construction. The handles and foot clamps are welded in position and are also cadmium plated to resist rust. It is made in form of a fustrum of a cone with an 8 in. diameter open base and a 4 in. diameter open top. Height is 12 in.

Soiltest Inc., 4711 W. North Ave., Chicago 39, Ill.

Enclosed Return Postal Card.
For more details circle 160 on

Manufacturers' Literature

"New Concept for Paving," a full color and sound movie released recently by Iowa Manufacturing Co., Cedar Rapids, Iowa, shows the laying of bituminous mat at high speed to meet all requirements of specifications and appearance. Picture shows details of machine operations under widely varying conditions. Running time 24 minutes.

For more details circle 161 on Enclosed Return Postal Card.

"You and Two-Way Mobile Radio": A 20-page booklet published by Motorola Communications and Industrial Electronics, Inc., 4501 Augusta Blvd., Chicago 51, Ill., is a reference primer on the entire field of 2-way radio. Today, there are approximately 750,000 mobile two-way radio transmitters operating in the United States with associated equipment. These represent a total investment of nearly a billion dollars. This booklet tells of the many fields serviced by these radios.

For more details circle 162 on Enclosed Return Postal Card.

(Continued on page 151)

L-20 White ASPHALT PLANT
PAYS FOR ITSELF IN 38 DAYS!*

*$14,700 F.O.B. Elkhart is price of portable model illustrated. Stationary model, $13,900 F.O.B. Complete, ready to operate. Prices subject to change without notice.

Make your own hot mix asphalt with this new WHITE plant and save up to $2.30 a ton. At its capacity of 160 tons an 8-hour day, that's a savings of $368.00 a day. Thirty-eight of those days pays for the L-20!

Produce any type mix you can get from a $100,000 plant: hot, RC, MC, SC and emulsified for top course, base course, one course, or patch. Two men operate. Capacity is rated at a hot 325 degrees.

The L-20 will supply black-top for suburban streets, driveways, parking lots, school yards, or state highway maintenance.

See your nearest distributor or write direct for full information.

White Manufacturing Company, Elkhart 2, Indiana

. . . for more details circle 317 on enclosed return postal card

here . . . without a doubt . . . is the most useful buying catalog in your office

. . . and here are some reasons why you should be USING IT DAILY!

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- Saves you the time and inconvenience of writing to manufacturers for catalogs.
- Gives you all the facts needed BEFORE you make a buying decision.
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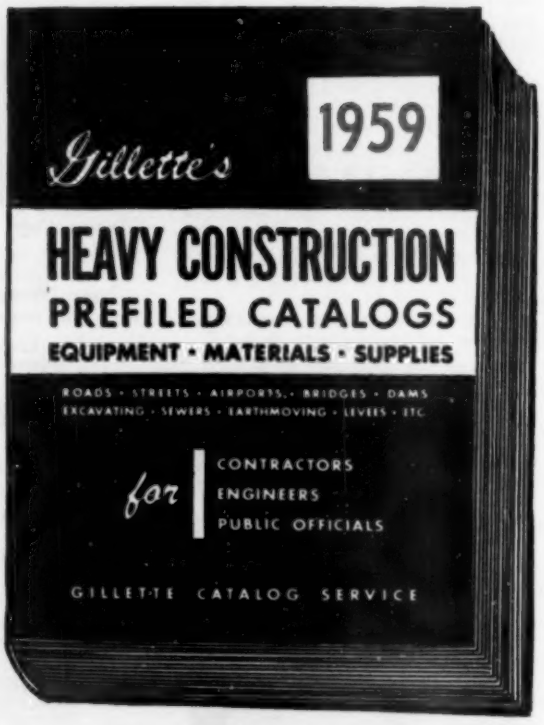
After checking the advantages listed above, you can see why this ONE CATALOG offers you so MANY advantages . . . saving you both time and money, not only in the mechanical and physical aspects of a cataloging operation . . . BUT MOST IMPORTANT OF ALL . . . it is available WHEN you NEED it . . . BEFORE you make your buying decisions! The manufacturers represented in this catalog are literally 'meeting' with you in your office — offering you all the information you could possibly need concerning their products. Why not meet them at least half way — and USE THEIR PREFILED INFORMATION!



Here are the manufacturers represented in Gillette's Heavy Construction Prefiled Catalog:

American Steel & Wire
Armco Drainage & Metal Products, Inc.
Austin-Western

Baldwin-Lima-Hamilton Corporation
Barber-Greene Company
Browning Manufacturing Company

Carey Manufacturing Company, The Philip
Chrysler Corporation, Industrial Engine Div.
Clark Industries
Cleaver-Brooks Company
Cleveland Form Grader Co., The
Cleveland Trencher Co., The
Colorado Fuel & Iron Corp., The
Continental Motors Corporation
Cummer & Son Co., The F. D.

Detroit Diesel Engine Div.

Erie Strayer Company

Flexible Road Joint Co., The

Gar-Bro Manufacturing Co.
General Motors Corp.
Gledhill Road Machinery Company, The

Harnischfeger Corporation
Heltzel Steel Form & Iron Co., The
Huber-Warco Company, The

Jackson Vibrators, Inc.
Joy Manufacturing Company

Miller-Tilt-Top Trailer Company
Minneapolis-Moline Company

Naugatuck Chemical Div.

Onan & Sons, Inc., D. W.
Owen Bucket Company, The

Phoenix Products Company
Pioneer Engineering
Pressite-Keystone Company

Republic Steel Corporation
Rogers Brothers Corporation
Rogers Dozer Rippers

Seaman-Andwall Corporation
Seaman-Gunnison Corporation
Servicised Products Corp.
Shawnee Mfg. Co., Inc.
Stow Manufacturing Co.
Symons Clamp & Manufacturing Co.

Timken Roller Bearing Co., The
Toncan Culvert Manufacturers Association

United States Rubber Company
United States Steel Corp.
Universal Form Clamp Company

Waukesha Motor Company
Williams Form Engineering Corp.

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Established, well known manufacturer combustion equipment has open sales areas for representatives regularly calling on asphalt paving contractors. Engineering background or practical experience in asphalt plant operation required. Drawing account for limited period against sales commissions. Write Box 1207, Roads & Streets, 22 W. Maple St., Chicago 10, Ill.

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Learn latest methods to organize and run work. Prepare for the top jobs. Send post card for details.
GEO. E. DEATHERAGE & SON
CONSTRUCTION CONSULTANTS
SATSUMA, FLORIDA

UNIT 1520 Self Propelled Rubber Tired Crane, 20 ton, used 500 hrs. Like new.

OSGOOD 810 Shovel-Crane, 1½ cy., w/671 GM diesel, air controls, late model, perfect. Cost $58,000. Sell $18,500. Rent $1,000/mo. apply purchase price. 50' crane boom available. Yard.

P&H 655B Dragline #11103 w/70' boom, fairlead, Cat. D1300 diesel good. $15,500 Rental Purchase. McAllen, Tex.

BACKHOE ATTACHMENTS for 1½ to 2 cy., Machines, brand new, complete, originally for Marion 372, can be made to fit others easily. With 2 cy. bucket. Cost $11,000. Sell $4,500 Yard.

LORAIN L41 & L150 Backhoe Attachment, gooseneck, good. $1,500 Yard.

HAISS 2 cy General Purpose Clamshells, new. Bargain. $1,500 Yard.

CEDARAPIDS SUPER ROCK-IT PORTABLE CRUSHING & SCREENING PLANT, complete w/22x25 r.b. Jaw, apron feeder, 3033 hammermill, 4x10 screen, rotovator, two delivery conveyors, twin 671 GM diesel power, factory tandem rubber. Excellent condition. Capacity 50-75 tph 1" minus. Less half price. Rent $2000/mo. apply purchase price $28,750.00 Yard.

UNIVERSAL 2030 Portable Plant w/18x24 rb. Jaw, apron feeder, #3 hammermill, 3x10 screen, rotovator tandem rubber. $15,000 Rental Purchase.

SHOVEL FRONTS for P&H 655B, excellent. $1,950 for P&H 255A, new. $850 for Bucyrus 22B, new. $1,500 for Unit 1020A, new. $1,250 for Koehring 206, complete, excellent. $450.

P&H 655 Shovel Buckets, new. $850. Fit other 1½ cy. machines.

CEDARAPIDS 3033 Hammermill, good. $2,750 Yard.

LIPPMANN 3036 Hammermill, good. $2,000 Yard.

INGERSOL RAND 315 cfm Portable Diesel Air Compressor, runs good. Bargain. $1,250 Yard.

WENZEL MACHY. CO.
565 S. 10th, KANSAS CITY, KANS.
MAyfair 1-1711

FOR SALE

Syntron F-45 Feeder and Grizzly. Unused	$1,850.00
American Pulverizer Hammermill Crusher, 24"x24"	$1,500.00
Electric motor for above, 40 hp, 900 RPM, 220/440/60, 3 phase. Price	$425.00
#6 Traxcavator, 1955, S/N 10A870. Price	$8,500.00
Tournarocker C-11, with Cummins diesel	$7,500.00
Tournarocker C-11, needs repair — Price	$2,500.00
Gruendler R.B. Jaw Crusher, 24"x36"x12' apron feeder	$9,000.00
Lippman 6'x34' Sand Drag. Price	$1,500.00
Diamond 3'x12' Sand Drag. Price	$300.00
Eagle Twin Screw, 24"x15'. Price	$1,200.00
4'x8' Hewitt-Robbins Screen, double deck	$600.00

GREENBANK SAND & GRAVEL COMPANY
1146 Summit Street, North
Barberton, Ohio PLaza 3-8481

FOR SALE

LATE MODELS MIDWEST LOCATIONS

Manitowoc 3000-B's, 3500's erect cranes—shovels, long booms, wide long cats diesels. Also 2000-B's.

Northwest 6's, 80-D's, and 95 cranes—drags—shovels, diesels, wide long cats—long booms. Ind. BH's.

Bucyrus-Erie 38-B's, 51-B's, 54-B's, cranes—drags, shovels, diesels, wide long cats—long booms.

Marion, Koehring, Link Belt & Lorain model cranes—drags—shovels, wide long cats—diesels. Also backhoe equipped machines, all types.

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PARK RIDGE, ILLINOIS

TANDEM TRUCKS

4—1956 RF195 IHC Truck, 157" W.B. RD-501 Engines, FA-110 Front Axle (11,000#) Air Brakes, 15" Clutch, T63 Transmission, A519 Auxiliary - 3-Way RA310 Rear Axle - Tires 11x22.5 Front, 10x22.5 Rear.

5—1953 IHC 195 Diesel Tandems, Cummins Diesel Engines, 157" W.B. 2A45 Auxiliary, F54 5-Spd. Transmission, Air Brakes, 28M Axle - Tires 10:00x20 Front, 9:00x20 Rear.

4—1956 T800 Fords with 8 to 10 yd. new Anthony dump bodies.

7—1956 F-900 Fords with Tag Axle F54-5 Spd. Transmission, 3-Way Auxiliary Transmission. Equipped with 8-10 yd. Anthony Dump Bodies.

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INTERNATIONAL TRUCK DEALER
Phone 2527
YANKTON, SOUTH DAKOTA

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FOR MOUNTING ON YOUR OWN TRUCKS

Photo of Crane Mounted on Army 6 x 6.

8000# CAPACITY - WEIGHT 9000#

Hydraulic Cable Lift
Hyd. Telescoping Boom
Hydraulic 360° Swing

Includes 4 Outriggers - Weighted Ball Hook - Heavy Steel Bed - Splash Shields - Operator's Cab - Floodlights and other Extras.

Complete and Ready to Mount - A $10,000.00 Value For a Fraction of Cost.

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CANTON INDUSTRIAL SALVAGE CO.

1510 S. Market Ave. - Phone GL 2-6995 - Canton, Ohio

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(location at Cedar Rapids, Iowa)

1—53x60 Heavy-duty, Double-Impeller, Iowa Mfg. Impact Breaker in excellent mechanical condition, complete with feeder. Used about 7 months.

1—155' x 42" conveyor

1—160' x 42" conveyor
Complete with troughing and return rolls, gravity take-up assembly and belt. Used 7 months and in very good condition.

For Sale (location near Marion, Virginia)

1—Link Belt-Speeder Shovel, Serial No. 2744, Model K-370, GMC Power Unit Serial 6-21241, Model 60300-LH RPM 1825

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1—Link Belt-Speeder Shovel, Serial No. 1933, Model K-580, Waukesha-Hesselman Power Unit, Serial 467843, Model 6NKH, 80' Boom, Dragline Esco Bucket Capacity 2½ Yd.

1—P & H Shovel, Serial 12267, Model 1055 LC, Buda Power Unit, Serial No. 36984F, Model 6DCS 1879, Light Plant Kohler, Serial 142110, Model E Dragline Bucket 4 Yd.

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Tel.: EMpire 4-0201
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Mining Contractors, Inc.
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GRADING EQUIPMENT

TRACTORS

(1) D-8 Cat w/Angle Blade and Cat 25 DDP Unit, S/N 2U5173... $10,000.00
(1) D-8 Cat w/Angle Blade and Garwood DDP Unit, S/N 1H8690.. 7,000.00
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All above tractors in perfect mechanical condition.

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(1) Garwood 25 cu. yd. S/N 5231 (Good) 5,500.00

AIR COMPRESSORS

(1) Gardner Denver 210 ft., S/N 116096, w/Cat Diesel Engine, 4 Steel Wheels 3,500.00
(1) Worthington 105 Ft., S/N 18239, Continental Gas Engine, 2 Pneumatic tires 1,500.00

Compressors Perfect Condition.

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FOR SALE

34E Twin Batch Koehring Paver, S/N 21091 ..... $8,000.00
34E Twin Batch Multi-Foote Paver, S/N 46D511 ..... $8,000.00
6000 feet—Blaw-Knox 9" Road Forms ..... $1.40 per ft.
Blaw-Knox Power Sub-Grader, S/N 56GC3 ..... $15,000.00
(40) Batch Boxes ..... $50.00 and $75.00 each.

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- ATTACHMENTS -

1—22-B Shovel front complete less dipper trip. Excellent condition. F.O.B. Cleveland, Ohio $1,500.00

Also Dragshovel Attachments for

1—Koehring Model 304 with ¾ yd. and ½ yd. dippers. Fair.
1—Model 255A P&H. Good.
1—Lorain Model 41 or Model 50. Excellent.

THE W. T. WALSH EQUIPMENT CO.
12750 Berea Rd. - Cleveland 11, Ohio

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Oliver OC-46-G—used only 110 hrs. 5/8 yd. shuttle trans. ..... $ 4,185.00
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Case-TerraTrac—800-D Demonstrator $11,990.00

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MISCELLANEOUS SMALL TOOLS i.e.; PUMPS, VIBRATORS, FORM TAMPERS, ETC.

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Telephone: PResident 7-1200

FOR SALE

1—Lorain Model L-85 2½ cy Shovel S/N 28027 Year 1956 ..... $45,000.00

1—Bucyrus-Erie 54B Combination Shovel Clam Drag and Lifting—90 Ft. Boom S/N 112767—1955 ..... $57,500.00

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2 American R 20 Revolver Cranes

1 American R 25 Revolver Cranes

Walsh-Perini-Morrison-Kiewit-Utah Companies

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FOR SALE

Euclid Loader Model BV-3 S/N-18 powered by Cummins HBID 150 H.P. diesel engine. 54" belt. New 1949 used approx. 1000 hours. Maybe seen at Council Bluffs, Iowa.

MAKE OFFER

Foley Brothers, Inc.

900 New York Bldg., St. Paul, Minnesota

USED EQUIPMENT FOR SALE

2—Caterpillar D9 Tractors with Rear Double Drum Power Control Units, "C" Frames and Push Cups. New August, 1957.

1—Caterpillar D9 Tractor with Push Plate Only. New January, 1956.

1—Caterpillar D9 Tractor with Rear Double Drum Power Control Unit and Cable Dozer. New March, 1956.

3—Caterpillar DW21's. 2 New 1956, 1 New '55.

5—Seaman-Andwell Pulverizers with GMC Diesel Engines. 4" Water Pumps. 1956 Machines.

All of the above are in excellent operating condition and are at present working in the Chicago area. They may be inspected at any time.

1—International TD24 with Rear Power Control Unit and Cable Dozer. An older machine, but in good operating condition. Make us an offer on this one.

Allis-Chalmers Model TS360 Motor Scrapers. These have been completey rebuit and are ready to go.

Allis-Chalmers HD21's. One with Hydraulic Dozer and Tractomotive Ripper. Two with Cable Dozers and Rear Power Control Units. All rebuilt and guaranteed.

2—Bucyrus-Erie Model 22-B ¾ yd. Combination Dragline and Clamshell—50' Boom, GMC Diesel Engine.

All of the above equipment is located at Hillside, Illinois and is in very good operating condition. It may be inspected at any time.

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D. D. KENNEDY, INC.

P. O. Box 177 - Bellwood, Illinois
Chicago: AU 7-4300 - Suburban: LI 4-5600

Here's LOW COST Loading-Screening

WITH NO SACRIFICE OF STRENGTH OR CAPACITY

KOLMAN MODEL 202 CONVEYOR

Model 202, 40' x 24", 6' x 36" Model SB-60 Screen, Model VH-4, 17 to 30 HP Wisconsin gasoline air-cooled engine, attached Reciprocating Plate Feeder, Hopper and roof type grizzly bars.

Single-deck vibrating screen folds into towing position without dismounting screen or any of the drive assembly.

Rugged construction of Model 202 permits use of double-deck KOLMAN screen to make several sizes of material at once.

Rugged Box-Type Construction Permits Amazing Low Price

The Model 202 meets the demand for a conveyor in the low price field stout enough to carry a large single or double-deck vibrating screen and loading trap in a completely portable conveyor-screen plant.

"Box-Type" Construction

The rugged "box-type" construction of the Model 202 conveyor gives it unusual strength and rigidity. The sides are fabricated of 3/16" steel plate formed into a channel 16" deep with 2" legs. The steel belt cover reaches completely across the top, completing the box and completely encasing the return belt to prevent materials from working in to cause belt damage.

The under-slung power unit provides easy access for servicing and operation.

Folding Feature

The 202 is available with the Head Pulley Clutch feature which allows the belt to be stopped and started while the vibrating screen remains in operation.

The KOLMAN Model 202 is rugged enough to carry a loading trap and large vibrating screen without additional support. It will take the kind of punishment that is dished out in a portable outfit—and will cost you far less money to own and operate. Available in 18" or 24" belt width, in lengths up to 50'.

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KOLMAN MANUFACTURING CO.
5100 West Twelfth St. Sioux Falls, S. D.

3 BEST BUYS
Subject to Prior Sale

1—Used 5½-yd. Transit Mix on Sterling Diesel Chassis.

1—Used Earth Boring Machine complete with Body, Fore & Aft Travel, Turntable, Pole Setting Mast, Hydraulic Winch, Mounted on Marmon-Herrington All-Wheel-Drive Chassis.

1—Used 4-Wheel-Drive Line Truck, including Tripods, Winch and Special Lights.

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457 Windsor Ave., Wilson, Conn.
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CHapel 9-5859

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1790 pcs.	30 to 40 ft. Conv.	MP-101	New York
168 pcs.	60 ft.	Both, SP-4	West Va.
428 pcs.	60 to 85 ft.	Conv. MP-110	Illinois
146 pcs.	60 & 50 ft.	Both, AP-3	New York
100 pcs.	60 & 50 ft.	Conv. MP-115	Indiana
245 pcs.	60 ft.	MP-110 & MP-115	Tennessee
393 pcs.	40 to 50 ft.	Z-27 & Z-32	Louisiana
885 pcs.	40 to 60 ft.	Z-22 & Z-27	Maryland

Other lengths and sections at other locations including storage yards at BUFFALO - BALTIMORE - NEW ORLEANS - MEMPHIS - CHICAGO.

McKiernan-Terry and Vulcan Pile Hammers and Extractors Construction and Railroad Equipment

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1906 Railway Exchange Bldg.
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COMPLETE - PORTABLE

All 3 Phase, 60 Cycle - 1 Phase & 50 Cycle Available
Also Direct Current In Similar Ratings
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KVA	ENGINE	MODEL	RPM	VOLTS	QTY.
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180	G.M.	6-71 Twin	1800	240-480-600-2400	1
125	Cummins	HRIB	1800	240-480-600-2400	2
125	P & H	687C-FS	1800	120-208/480	3
125	International	UD-24	1200	120-208/480	2
125	G.M.	6-71	1800	120-208/480	1
93	Cummins	HRIB	1200	120-208/480	1
75	G.M.	6-71	1200	120-208/480	3
75	Buda	6DC-844	1200	120-208/480	1
75	P & H	687C	1200	120-208/480	1
37½	Buda	6DIG-317	1800	120-208/480	1
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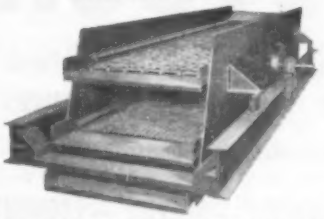

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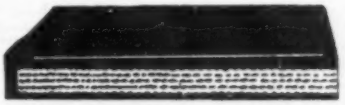

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Heavy Duty 4-ply, 28-oz. duck, ¼" top rubber cover x 1/32" bottom rubber cover belting having high tensile strength, tough cotton duck, strong carcass and proper flexibility. For heavy boxes, bags and bulk materials. Troughs easily. Famous brands at deep cut prices. Fresh stocks.

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20"	4	4.97 ft.	3.08 ft.
24"	4	5.85 ft.	3.45 ft.
30"	4	7.18 ft.	4.22 ft.
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Lorain Combination Clamshell-Dragline machine, Model L 41 with wide and long track, with 30" shoes, with 40' boom, with fairlead, with caterpillar diesel engine, completely rebuilt, excellent condition. Selling Price $15,000.00.

Barber-Greene, Model 840, two aggregate Black Top Plant, complete with pugmill, with 839 dryer, with dust collector, with cold feed, with two compartments, two material bin. Good condition. Price $15,000.00.

Koehring Dumpter, Model WD 60, with General Motors diesel engine, tires good, dumpter and engine completely rebuilt. In excellent condition. Selling Price $8500.00.

1—34E Koehring dual drum paver with Waukesha gasoline engine, with 35' boom, with standard water tank. Overhauled and in good condition. Price loaded on cars, St. Louis, Missouri $12,500.00.

ALLIED CONSTRUCTION EQUIPMENT CO.
4015 Forest Park Avenue — St. Louis 8, Missouri
Phones: FRanklin 1-1818 & 1-7132

FOR SALE

Four Super "C" LeTourneaus Converted to Hydraulic Steering - New 21:00 Tires, All Wheels - Rebuilt 150 H.P. Cummins Engine - Repainted - Looks Like New.

Located Frankfort, Indiana -

Wire Or Call Collect:

BILL BARRY
Phone MElrose 2-4433
Indianapolis, Indiana

NEW UNUSED ATTACHMENTS

LORAIN 820 Camelback 2 yard Backhoe	$7500.00
LORAIN 820 Craneboom 50' with Harness	2250.00
LORAIN 820 Shovelfront 2 yard	5000.00
LIMA 34 Camelback ¾ yard Backhoe	2750.00
LIMA 34 Shovelfront cablecrowd	1500.00
LIMA 34 Boom 35', Fairleads & Harness	1500.00
MARION 372 Backhoe, 1¾ yard	3500.00
MARION 372 Boom, Fairleads & Harness	2000.00
OMAHA 2-yard Dragbuckets	1000.00

We save you up to 50% of new price. Please advise your requirements. We have many others.

UDELSON TRUCK SALES, INC.
3210 Woodland Ave. — Superior 1-1666 — Cleveland, Ohio
Night — R. SNYDER — WHitehall 2-2821

5½', 4' & 3' SYMONS. 5360 Iowa double impeller IMPACTOR. A-C 636 type R HYDROCONE. Williams #28 Slugger port. HAMMERMILL. 160 engine & conveyor. Portable PRIMARY PLANTS 2836, 2236, 2436. 54" STEDMAN 4 cage mill. Four - Simplicity 6x14 heavy duty VIBRATING FEEDERS. 54"x16' & 42"x16' FEEDERS. Complete HYDRATED LIME PLANT 50 tons/day. 314 KW Cat. D-397 GENERATOR 440 volt. Four - 54-B electric SHOVELS. NW 80-D 6, 104, 25 - B.E. 37-B - Manitowoc 3500 - Koehring 605 - P&H 885 - Lorain 620 - Lima 1201, 802, 803. 27-T & 29-T DRILLS.

Crushers: jaw, cone; gyratory; roll; hammermill; impactor; ball, rod & tube mills; Screening, crushing & washing plants - Classifiers - Compressors - Conveyors - Cranes - Drills - Dump Cars - Dredges - Engines & Motors - Feeders - Generators - Hoists - Kilns & Dryers - Locomotives - Pumps - Screens - Shovels & Draglines - Transformers - Euclid Trucks.

STANLEY B. TROYER EQUIPMENT CO.
Box 97 — Phone 500 — Crosby, Minnesota

WANTED – DISCARDED
GM51-71-110 Injector Parts

Highway 7120 Carnegie Ave.
CLEVELAND 3, OHIO

WILL SELL
Cranes & Draglines
54B Bucyrus - 802 Lima - 1520 Unit

– Scrapers –
DW20 Cat. - DW21 Cat. -
TS 300 AC - S7 Euclid

– Tractors –
HD21 & HD16 AC

Asphalt Tanks
3 - New 9200 Gal., Insulated

TECON CORPORATION
202 Davis Bldg. - Dallas, Texas
Phone: Riverside 8-1441

BACKHOES
BRAND NEW – 1958
Complete with Cle-tracts
$3600 each

Consolidated Industries
P. O. Box 408 — Phone 5956
DOVER, DELAWARE

CONCRETE PAVER

- 34E Dual Drum Multifoote, Ser. No. 46D-605
- Powered by GM Diesel Engine
- New 1953

Machine rebuilt this past spring in our own shop with $8,000.00 worth new parts.

- SPECIAL PRICE—$19,500.00 -

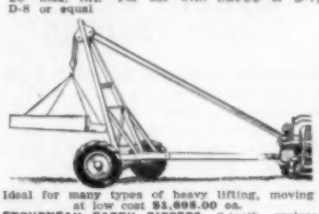
Your inspection invited in our yard,
83—2nd AVE., RENSSELAER, NEW YORK

R. B. WING & SON CORP.

384 Broadway Phone 3-4161 Albany, N. Y.

UNUSED ARMY SURPLUS!

40,000# RATED CAPACITY TOWED CRANES, CARCO, 2 ea. 1800 x 25 20-ply NEW TIRES, with all blocks and cable, complete as shown; 20' max. lift. For use with DDPCU or D-7, D-8 or equal



Ideal for many types of heavy lifting, moving at low cost $1,695.00 ea.

LETOURNEAU EARTH RIPPERS, 3-tooth, replaceable points, cable controls, steel wheels. UNUSED

Price—$1,695.00 ea.

UNITED ROAD MACHINERY CO.
2010 S. Bellevue St. Memphis, Tennessee
Phone WH 8-9041 Dept. RS

REBUILT EQUIPMENT FROM FRANTZ

Allis-Chalmers HD-20G, 4-yard Crawler Tractor-Loader, GM 6-110 diesel engine, 22" grousers, counterweight, heavy-duty undercarriage. No repairs needed. (New price - $47,000)	$17,000.00
Bucyrus-Erie 15B, half-yard Backhoe, Chrysler gas engine, 16" shoes. Ready to work	7,500.00
Terratrac Model 600, three-quarter yard Crawler Loader and Angledozer complete. New 1957. Terra-torque diesel - electric starting, automatic transmission	4,800.00
Allis-Chalmers HD-15G, three-quarter yard Crawler Tractor-Loader. GM 6-71 diesel, 20" grousers, counterweight, heavy-duty undercarriage. Rebuilt. (New price - $35,000.00)	12,000.00
Allis-Chalmers HD-9B Tractor with Baker hydraulic angledozer & double drum cable control unit. New rails - rollers	10,500.00
LaPlant C-106 Cable Scraper, 6-8 yd. cap. - to work with HD-9 tractor	4,000.00

FRANTZ EQUIPMENT CO.
50th & Wynnefield Ave. — GReenwood 7-7200
PHILADELPHIA 31, PENNSYLVANIA

FOR SALE

Gradall,
1955 Model 2460 $13,400

Lorain ⅜ cu. yd. Backhoe, 1953 Model TL-25-K approximately 100 hours $13,400

Caterpillar, 1 cu. yd. loader, 1957 Model 933, approximately 1600 hours $7,700

A. S. JOHNSON
2507 Archwood Ave.
Phone: SHadyside 1-3760
CLEVELAND 9, OHIO

FOR SALE

1 600 Cu. Ft. Chicago Pneumatic Rotary Air Compressor, Serial #59135 and 2 #800 G Chicago Pneumatic Track Drills, Serial #1019 and 2026.

12 Ft. mast heads and 4 in. drifters. One year old - used on one job only.

Price - $27,000.00 or Best Offer

Equipment located at Little Rock Air Force Base, Jacksonville, Arkansas.

CONTACT:

Thumm Construction Co.
4435 N. Damen Ave. - Longbeach 1-3210
Chicago 25, Illinois

New pocket-size optical RANGE FINDER quickly and accurately measures to 250 yards. Use for: Surveys, excavations, ditches, paving, black top, roads, driveways, parking lots, sidewalks, quarries, mines, curbing, drains, electric lines, across rivers, and many other measurements. If you order this Range Finder today it will soon earn many times its low cost by saving your valuable time and replacing guesswork with exact figures on all job estimating. Complete with case, instructions and 3 year guarantee. Price now only $19.50, postpaid.
McCanna Supply Company, Tarrytown 7, N. Y.

FOR SALE

1—15 Ton Bay City Cranemobile. 6x4 Carrier. Power load lowering, 70' pin connected boom, 3 sheave point, big swing clutches, good tires. Hercules JXD & WXL power. Jib, Fairlead and Rudomatic. Reasonable. Back Hoe available.

R. H. GOOD
10315 West Greenfield Ave. - SPring 4-4571
West Allis 14, Wisconsin

ARMY SURPLUS

ROLLERS

LIKE NEW

60 Day Warranty — $5,000.00 Ea.

Buffalo-Springfield 12-ton tandem, #19557 - hyd. steer, sprinkler system, diesel power.
Huber 10-ton 3-wheel, #10-821 - hyd. steer and hyd. scarifier, Hercules gas power.
Galion 10-ton 3-wheel, #CG-13210 - hyd. steer, hyd. scarifier, Hercules gas power.
Galion 10-ton Tandem, hyd. steer, UD-6 Diesel - #R-25165.

UDELSON TRUCK SALES, INC.
3210 Woodland Ave. - R. Snyder - SU 1-1666
CLEVELAND 15, OHIO

ATTACHMENTS AVAILABLE
Northwest - Bucyrus-Erie - Lima - Marion - Link Belt - Lorain - P&H - Manitowoc Shovels - Backhoe - Clam Drag - all sizes.
JAMES C. FRENCH
P. O. Box 188
226 Berry Pwy. Talcott 9-4927
PARK RIDGE ILLINOIS

FOR SALE

BACKHOE ATTACHMENTS...
...UNUSED GOV'T SURPLUS

For ¾ Yd. Northwest, Bay City, Lorain, Lima, Insley, Bucyrus Erie, P & H Linkbelt, Etc. Equipped with 36" bucket and teeth.

SPECIAL $1450 fob Atlanta

FULTON EQUIPMENT CO.
2235 Stewart Ave. S.W. PO. 7-8606
ATLANTA 15, GEORGIA

Clearing House Ads Bring Results

EQUIPMENT

FOR SALE

Link-Belt Speeder, 1½ yd. Drag and Clamshell with Dipper Bucket, Caterpillar 1700.
Marion 331 - ¾ yd. Excavator.
Northwest 25 - ¾ yd. Excavator, Drag and Clamshells.
Byers 83 - ¾ yd. Dragline Combination.
Byers 83 - ¾ yd. Dragline Clamshell.
International TD-14A Dozer.
D8 Caterpillar Dozer, Rear Cable DPCU.
D8 LeTourneau DPCU.
D8 - 2U2745, DPCU.
D8 - 2U1495. Caterpillar Rear Cable Control.
D8 - 2U2999. Hydraulic, Straight Blade with Hyster Winch.
LeTourneau Tournapull. Carryall Scraper - GM 6-71.
Caterpillar - Model 12. Motor Patrol.
Koehring Batch Mixer, 28 cu. ft.
T. L. Smith Batch Mixer, 14 cu. ft.
Kwik-Mix Mixer, 11 cu. ft.
Gar. Bro. 2 cu. yd. Concrete Buckets (for sale or rent).
Four Murray & Tregurtha Sea Mules with GM diesel 6-71. Two almost new; others in good condition.
Flynn Mixer.
Three GM Diesels - Model 3-71.
Two 300 Amp Welders with Model 2-71 GM Diesels.

B. A. HOFFMAN
6016 Feagan St. - Hoston 7, Texas
Phone: UNderwood 2-9687

FOR SALE

6 IH TD24's — Recently Traded Against New CAT Equipment
LATE 1955 MODELS, Torque Converters, Cable Controls, Bulldozers; One hydraulic
Priced From EACH $6,000.00 TO $16,500.00

1 A-C HD20H — $10,500.00
Torque Drive GarWood Cable Control and Bulldozer

3 A-C HD15's
With Hydraulic Bulldozers
Good, Clean Machines
Priced From EACH $8,700.00 TO $10,500.00

14 LeT. SCRAPERS
Models - LS, LP, and W
Priced From EACH $2,250.00 TO $4,500.00

ALSO AVAILABLE LeT. Model D and Model C Tournapulls

1 Bucyrus Erie B170 SCRAPER — EXCELLENT CONDITION — $7,500.00

All Subject to Prior Sale

H. O. PENN MACHINERY CO., INC.
140 Street & East River, New York 54, N. Y. Tel. CYpress 2-4800

MODERN TRUCK CRANES

Link Belt Speeder — Model HC-70, 1951, 20 ton capacity, 80' Pin connected Folding Boom.
Price.....$16,500.00

Bucyrus-Erie—Model 22-B, like new. 80' Pin connected Folding Boom.
Price.....$18,500.00

P & H Model 150, 60' Boom 20' Jib.
Price.....$10,500.00

Also several late Model Crawler Cranes, Shovels and Backhoes

UNITED
CRANE and SHOVEL SERVICE CO.
Incorporated
MICHIGAN AVENUE, KENILWORTH, N. J.
Chestnut 5-6260

FALL CLEARANCE

IF PRICE NOT SATISFACTORY—NO REASONABLE OFFER REJECTED

1—Used Schield-Bantam Model M-49, ⅜ yd. trenchoe, GMC 6x6 truck. Good condition - cleaned and painted $3,500.00
1—Used Thew-Lorain Model L-82, 2 yd. combination clamshell-dragline; 80 ft. boom; D-13000 power with fluid coupling. Good operating condition $15,000.00
1—Used Unit Model 514, ½ yd. trenchoe; gas powered; operating condition $1,500.00
1—Used Unit ⅜ yd. shovel; powered by a Waukesha gas engine. Operating condition $1,500.00
1—Used Koehring Model 205, ½ yd. shovel; International diesel power $2,500.00
1—Orton crawler mounted steam crane; operating condition $2,500.00
3—Essick Model 350 concrete mixers, gas powered. Good condition $225.00
2—New Joy Model RP-125 Rotary air compressors - used for demonstration only .....$3,500.00 each
2—Used Joy WK-80, 125 cu. ft. portable air compressors. Excellent condition. .....$2,500.00 each
2—Used Joy WK-80, 75 cu. ft. portable air compressors. Good operating condition. .....$1,750.00 each
4—Gorman-Rupp 1½" "Midget" self-priming pumps. Good condition .....$130.00 each
1—Gorman-Rupp 2" "Pelican" self-priming pump. Good condition $150.00
1—Gorman-Rupp 4", 40-M, self-priming pump on rubber tires $950.00
1—Essick Model 44 plaster mixer. Good condition $300.00

MISCELLANEOUS: Breakers, rock drills & tampers — NEW AND USED

DIMOND-COLLOTON EQUIPMENT CO.
4257 N. 124th Street — Milwaukee 16, Wisconsin
SUnset 6-8200 & 8201

FOR SALE

One LeTourneau Westinghouse "C" TOURNAMATIC #GP40607 CPF-T with "C" Scraper #S60717. Very good condition.

One Pioneer Bituminous Paver #11-137 Factory Modified to include latest changes. Very good condition. Priced to Sell.

Thornton Construction Co., Inc.
Hancock, Michigan - Phone 2220

FOR SALE
1—1956 Model 955 Caterpillar Loader with scarifiers.
1—1957 Martin 25T Tandem Trailer and F900 Ford Tractor. Excellent Condition.
JOHN P. CARROLL
1703 Guilford St. Phone: 2968
Huntington, Indiana

FOR SALE

1 LITTLEFORD BROTHERS MODEL 3000-E KWIK STEAM GENERATOR
125 HP, electric drive, water treating tanks, reconditioned.
F.O.B. Lexington, Kentucky
$3,500.00

1—Link-Belt—LS-52
¾ yd. Crane.
With GMC Diesel Engine, Speed-O-Matic Controls, Rapid boom hoist, 40' boom, Rud-O-Matic tagline winder, reconditioned.
F.O.B. Lexington, Kentucky
Priced to Sell

WILSON MACHINERY & SUPPLY COMPANY
Lexington, Kentucky - Phone: 3-1450

USED EQUIPMENT FOR SALE

CRANE
Michigan ⅜ Yd. (on rubber) $3,500

DRAGLINE
Lorain-Dixie ⅜ Yd. Serial #145 (on rubber) $9,500

TRENCHER
Cleveland Model 95 Serial #2973 .....$3,500

AIR COMPRESSOR
Sullivan 105WK60 Serial #222346 .....$500

GARDNER-DENVER
w/International Gas Engine Pumps to 300# pressure $800

TRUCKS
1948 2-Ton GMC Line with Winch $600
1950 3½-Ton GMC Line with Winch $900
1948 ½-Ton Chev. Pickup with Utility Box $300

MULDER'S WELDING & STEEL FAB. CO.
11441 E. Lakewood Blvd.
Holland, Michigan—Export 6-7171

● **This Flex-Beam guardrail installation on the New Jersey Turnpike illustrates first two points of proper erection—distance from pavement and flared for visibility and safety.**

Tips on Installing Beam Guard Rail

These important safety points are stressed by Armco Drainage & Metal Products, Inc., in the proper installation of beam-type guardrail:

1. Place rail as far as possible from the edge of roadway.
2. Introduce a flare on the end of each run to increase visibility and reduce the possibility of striking the installation directly on the end.
3. Reduce rather than increase the nominal height of 18 in. from ground to center of rail element. Height of bumpers on new cars are lower than ever.
4. On bridges or at points involving curbs and walks, adjust or reduce the height.

Distributor Questions Need For "Surplus Equipment"

H. D. Anderson, President of Associated Equipment Distributors, a national association of more than 800 heavy construction equipment dealers, last week advised the House Committee On Government Operations that the Administration's methods of disposal of construction machinery are placing local government agencies in competiton with distributors and contractors, to the detriment of the construction industry.

Mr. Anderson, who is President of Rish Equipment Co., Bluefield, W. Va., testified that local civil defense agencies and soil conservation districts are receiving surplus construction equipment at little or no cost, and are using the equipment in competition with contractors.

The AED leader presented the House Committee with documented evidence that these local agencies are acquirng equipment far beyond their needs and are renting and selling the equipment in competition with equipment distributors. "No matter how you look at this situation, it is obvious that the military establishments are buying more equipment than they need," Mr. Anderson stated. "As they generate these huge quantites of surplus equipment, they will feed more and more of it to local government agencies. This in turn will put the local government in direct competition with our industry and the customers we serve."

Mr. Anderson also deplored the huge amounts of over-seas surplus allowed to enter the United States under licenses ostensibly for re-export. He said that officials of the Bureau of Customs and the Department of Commerce had admitted "The door is wide open for violations of Public Law 152, and that neither the Department of Commerce nor the Bureau of Customs has either the personnel or appropriations to police the situation."

Contractor, Too, Needs Chance For His Planning

Testimony given in Washington before the Committee on Public Works, House of Representatives, in support of Measure H.R. 12808, drew some comment of interest to the highway fraternity.

This is the measure proposed by Congressman Fallon to continue our accelerated federal highway construction program on a needs basis.

Testifying in behalf of the Associated General Contractors of America, Inc. of which he is a highway contractor division past president, M. Clare Miller of a Kansas roadbuilding firm, stressed the importance of a continuing, orderly, properly financed highway program.

"But just as the engineers must plan and project their programs on more than a season-to-season basis," said Mr. Miller, "so must the contractor. And, like the awarding agencies, the farther ahead the contractor can assess his volume of work, distribution of equipment, purchase of materials and utilization of personnel, the more economically he can operate, and the better prices he can offer. For example, the bill to permit reimbursement for materials delivered to the job site, which was introduced by Congressman Schwengel of this Committee and written into the 1958 Act, is resulting in savings to the contractor and in turn to the public in the form of lower bid prices." Contractor Miller noted particularly that the smaller contractor is especially in need of a stable yearly market for his services, so that he can plan efficiently. Over 92 percent of the A.G.C.'s highway members are "small business concerns" having an annual gross volume including all work performed of $5,000,000 or less.

ELECTRO-MAGIC
Motor Steam Cleaners

Sell for only **$329**
FOB FACTORY

Fully Automatic

ELECTRO-MAGIC CAR WASHERS SELL FOR ONLY $198.00 F.O.B. FACTORY

RUBBER TIRES EXTRA

Dealers wanted to sell this unit in your own territory . . . make up to $500 weekly. Order a sample unit and you are ready for business. Literature and details sent on request.

ELECTRONIC'S INC. **Vermillion, S. D.**

. . . for more details circle 259 on enclosed return postal card

Manufacturers' Literature

(Continued from page 137)

"THE ONLY SAFE PAVEMENT IS A BARE PAVEMENT": With this theme, International Salt Co., Scranton, Pa., presents its 28-page booklet, "Bare Pavement Maintenance", dealing with the effects of salt on road safety, methods of salt application, and economics.

For more details circle 163 on Enclosed Return Postal Card.

ACKER DRILL CO., INC., P.O. Box 830, Scranton, Pa., has issued Bulletin 40-R describing its all-purpose earth auger, which has wide application in soil sampling, core drilling, mineral prospecting, and general purpose earth augering.

For more details circle 164 on Enclosed Return Postal Card.

"BETTER ROADS WITH STERLING ROCK SALT": A 12-page booklet, available from Highway Sales Department, International Salt Company, Scranton, Pa. describes International's simplified seven-stop method of road improvement with rock salt.

For more details circle 165 on Enclosed Return Postal Card.

CEMENT MANUFACTURING: Calaveras Cement Co., 315 Montgomery St., San Francisco 4, Calif., has published a 16-page brochure describing the cement manufacturing process in detail. Thirty photographs and a flow chart accompany a simple explanatory text which in effect gives the reader a "tour" of the company's San Andreas Plant.

For more details circle 166 on Enclosed Return Postal Card.

CONTRACTORS' PUMPS: Specification sheets available from Worthington Corporation, Advertising and Sales Promotion Department, Harrison, N.J. contain complete pump and engine data for two new size models of contractors' pumps. Bulletin 6525-S5 covers the 15M Model, and Bulletin 6225-S6 covers the 20M Model.

For more details circle 167 on Enclosed Return Postal Card.

A COMPLETE LISTING OF 1958 LAWS ON VEHICLES SAFETY EQUIPMENT is contained in a ready-reference bulletin for fleet operators and equipment jobbers, just issued by R. E. Dietz Company, 225 Wilkenson St., Syracuse, N. Y. The bulletin gives requirements for automotive lights of all types, reflectors, flares, warning markers, and includes a special section on turn signal regulations.

For more details circle 168 on Enclosed Return Postal Card.

D. W. ONAN & SONS, INC., Minneapolis 14, Minn., has issued a 4-page folder F-123, telling what should be considered in selecting an electric generating plant. On-the-job pictures of plants are included.

For more details circle 169 on Enclosed Return Postal Card.

TRUCO MASONRY DRILLING DIVISION, WHEEL TRUEING TOOL CO., 3200-263 West Division Ave., Detroit 38, Mich. has issued a new catalog containing illustrations of Truco portable diamond drilling equipment and accessories used in masonry drilling operations. On-the-job photographs and descriptions of particularly difficult drilling situations are included.

For more details circle 170 on Enclosed Return Postal Card.

BITUMINOUS PLANT: An 8-page folder released by Pioneer Engineering, Division of Poor & Co., 3200 Como Ave. Southeast, Minneapolis 14, Minn., describes in detail Pioneer's new "Autobatch" bituminous plant. Full cutaway shows how plant functions, with flow of materials clearly illustrated. Also shown is flow of material through drier and elevators. Complete specifications are given.

For more details circle 171 on Enclosed Return Postal Card.

WEMCO PRODUCTS DIVISION, WESTERN MACHINERY CO., 650 Fifth St., San Francisco 7, Calif. has announced a 40-page book, Bulletin G7-B25, describing methods of aggregate preparation, benefactions, and handling. It is illustrated with charts, working drawings and photographs describing the use of Wemco equipment in the aggregate industry.

For more details circle 172 on Enclosed Return Postal Card.

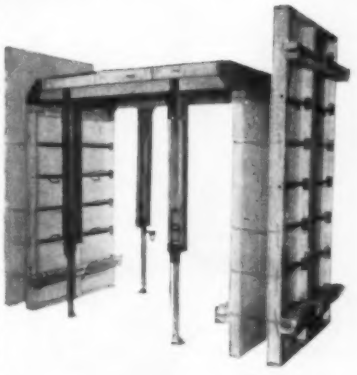
SYNTRON CO., 384 Lexington Ave., Homer City, Pa. has published a new condensed catalog of its vibratory bulk materials-handling equipment and other products. The catalog has 64 pages of product illustrations, descriptions and specifications and includes illustrations of typical installations.

For more details circle 173 on Enclosed Return Postal Card.

EUCLID DIVISION OF GENERAL MOTORS CORPORATION, Cleveland 17, Ohio, has just released a new brochure Form 326R describing its entire line of earthmoving equipment. Twenty-four different models are pictured and described in the compact folder. Included are condensed specifications on nine rear dumps, three bottom dumps, three coal haulers, six scrapers, one crawler tractor and two log haulers.

For more details circle 174 on Enclosed Return Postal Card.

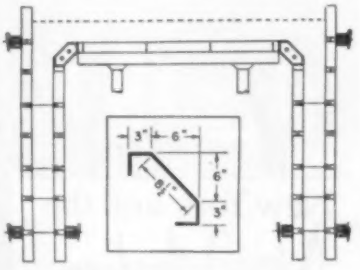
Culvert Forming



Symons Develops New Haunch Form for Culverts

Symons Safety Shores Used to Support Slab

Symons now has a new 9 x 9 inch steel haunch section designed to connect Symons standard wall panels and slab panels for the monolithic pouring of culverts. This new section provides for a 3-inch face on the roof slab and



on the wall with a 45-degree-angle surface 8½ inches wide between wall and roof. No built-up forms or other special equipment is necessary.

Made of 11-gauge hot rolled steel this new section is available in 4, 6, and 8 foot lengths. It can be used with either metal frame or wood frame forms. Symons regular form hardware is used for securing the steel section to Symons standard forms. No special fittings are required.

Symons forms, shores and column clamps may be rented with purchase option. FREE literature on Symons products is available upon request.

Symons

SYMONS CLAMP & MFG. CO.
4283 Diversey Avenue, Dept. J-8
Chicago 39, Illinois

. . . for more details circle 309 on enclosed return postal card

Your Choice for Convenience in PITTSBURGH

Hotel Pittsburgher

Right in the heart of the Golden Triangle 400 outside rooms with TV and every comfort of modern hotel design. General Forbes Lounge and Dining Room... Air Conditioning. Airport Limousine and Taxi Service.

Forbes Avenue Below Grant

ATlantic 1-6970

Jacktown Motor Hotel

The very finest accommodations. 60 air-conditioned rooms with TV, telephone, combination tile baths. Excellent dining room. Facilities for group parties 15 to 500.

Route 30 Irwin, Pa.
1 mile West of Irwin Interchange

UNderhill 3-2100

Hotel Pittsburgher Motel

KNOTT K HOTELS

Opposite Greater Pittsburgh Airport on beautiful Airport Parkway West. 56 luxurious air-conditioned rooms with tile bath, TV, private phone. Courtesy car to and from airport.

AMherst 4-5152

Joseph F. Duddy, Gen. Mgr.

*Teletype Service. For immediate confirmation of reservations at no charge... telephone any Knott Hotel—or teletype PG-29.

CALCIUM CHLORIDE INSTITUTE, 909 Ring Building, Washington 6, D. C. has published a 4-page leaflet describing the success of the Ohio Turnpike maintenance department in using bulk calcium chloride. Leaflet explains how the Commission has stored calcium chloride outside under tarpaulins for extended periods prior to use with abrasives, and direct for ice control.

For more details circle 175 on Enclosed Return Postal Card.

TRACTOR DOZERS: A new 20-page catalog available from Construction Machinery Division, Clark Equipment Co., P.O. Box 599, Benton Harbor, Mich. describes the "Michigan" Models 180, 280 and 380 tractor dozers design and operating features of these 162 hp, 262 hp and 375 hp rubber-tired machines and illustrated are described.

For more details circle 176 on Enclosed Return Postal Card.

TRACTOR SHOVEL: Contractors Machinery Division of the Yale & Towne Manufacturing Co., Batavia, N.Y. has released a specification bulletin explaining the features of the Model T-18 Trojan tractor shovel. The T-18 has six interchangeable buckets giving the machine a carrying range of 14 to 29 cu. ft.

For more details circle 177 on Enclosed Return Postal Card.

WALL COLMONOY CORPORATION, 19345 John R Street, Detroit, Mich., has issued a 2-page brochure describing its new Colmonoy semi-automatic welder. Brochure points out and illustrates major construction features of welder and lists a wide variety of typical applications.

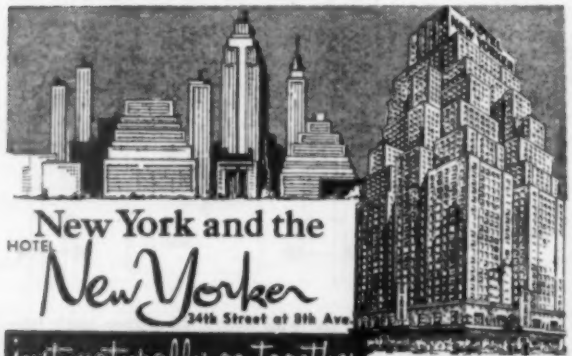
For more details circle 178 on Enclosed Return Postal Card.

D-A LUBRICANT COMPANY, INC., Indianapolis 23, Ind. has published a new folder providing complete information on D-A torque fluid. It describes the use of the fluid in heavy-duty automatic transmissions, torque converters, rotary air compressors and hydraulic systems.

For more details circle 179 on Enclosed Return Postal Card.

"BALANCED POWER—MATCHED TO JOB": An 8-page booklet Form No. D837, released by Caterpillar Tractor Co., Peoria, Ill. discusses choosing equipment that is the right size for the job. Booklet explains advantages of D4, D6 and D8 tractors and includes brief specifications. It also explains how matched tools boost production by adjusting each tractor to the specific job. Methods for selecting used equipment also are discussed.

For more details circle 180 on Enclosed Return Postal Card.



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"Steel Sheeting For Trenches, Cofferdams, Cutoff Walls and Shore Protection," a new catalog, SH-4658, available from Product Information Service, Armco Drainage & Metal Products, Inc., Middletown, Ohio, discusses two types of sheeting—flange and interlocking. Physical properties and driving data are given, and typical jobs described and illustrated. A method of figuring size and spacing of wales and struts is given.

For more details circle 181 on Enclosed Return Postal Card.

Leschen Wire Rope Division, H. K. Porter Co., Inc., 2727 Hamilton Ave., St. Louis 12, Mo., has released a brochure describing the properties and characteristics of 7-wire high-strength stress-relieved strand for prestressed concrete. Brochure contains typical stress-strain curves of 3/8 and 7/16-in. strands, together with data concerning breaking strength, yield strength at 1% elongation, ultimate elongation in 24 in. and typical elongation in 10 ft at recommended prestressing load.

For more details circle 182 on Enclosed Return Postal Card.

Off-The-Road Tires Handbook: A 54-page handbook covering its line of off-the-road tires has been published by the B. F. Goodrich Co., Akron, Ohio. It includes illustrations and brief descriptions of 56 different types of tires, ranging from rock service to road roller tires. Tire data for the various types are given as well as load and inflation tables for tires in earth-moving service. There is also a liquid inflation chart. A section of the catalog tells how to get maximum service from off-the-road tires.

For more details circle 183 on Enclosed Return Postal Card.

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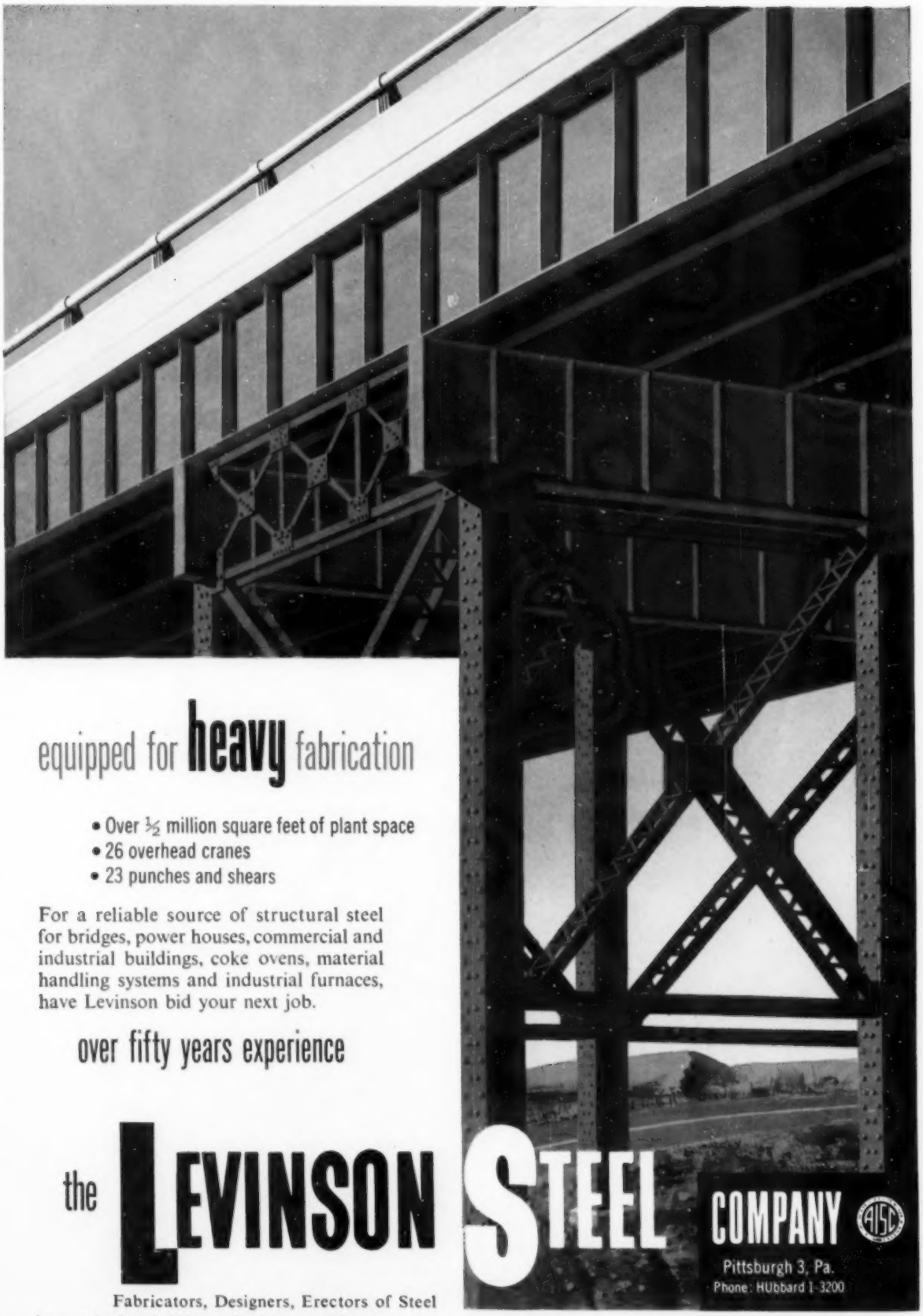

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